December 14, 2015

# OkMap
# GPS Mapping software

http://www.okmap.org

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# Introduction

## References

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| **Forum** | http://www.okmap.org/forum |
| **OkMap Desktop** | http://www.okmap.org/en/okmapDesktopFeatures.aspx |
| **This manual** | http://www.okmap.org/download/okmap_en.pdf |

## Other products for iOS

| | |
|---|---|
| **OkMap Mobile** | OkMap Mobile, an off road GPS navigator with offline custom maps for your outdoor activities https://itunes.apple.com/us/app/okmap-mobile/id949554920 |
| **Mountains AR** | Mountains AR the augmented reality to discover mountains, peaks and summits around me https://itunes.apple.com/us/app/mountains-ar/id884969067 |
| **Touristic Italy** | Touristic Italy the augmented reality to discover monuments, attractions and services around me https://itunes.apple.com/us/app/touristic-italy-augmented/id896425768 |

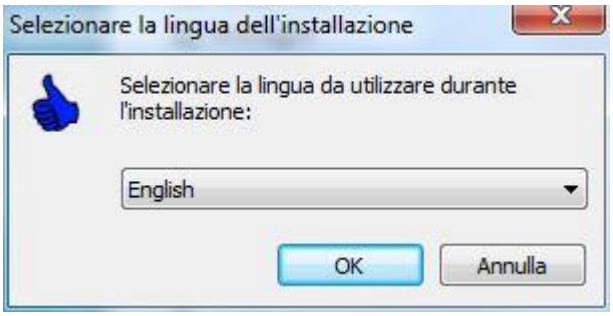
# Installation

## Software installation

After downloaded the installation kit of OkMap, use WinZip program to unzip the file.

**Warning**: Before installing OkMap is necessary, if not already installed, download MicrosoftFramework3.5 SP 1 and install it on your computer.

To install OkMap open the *setup_<version>.exe* file; it displays the following window:




Select your language and then press the *OK* button.

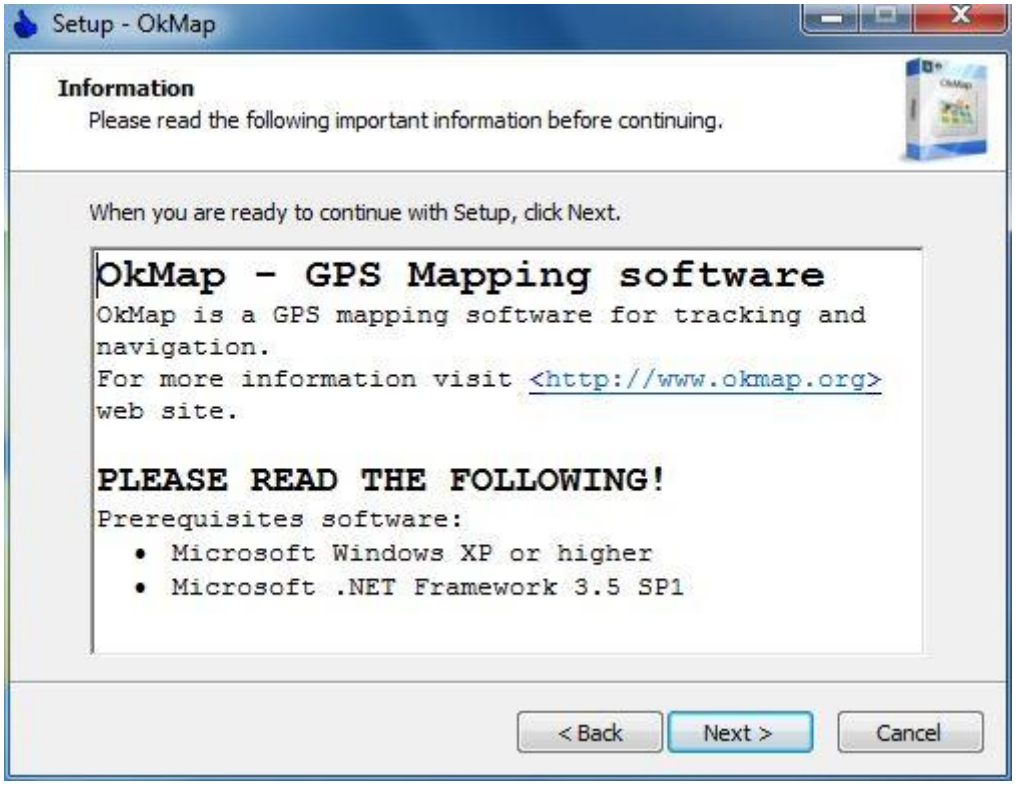
Setup - OkMap
Welcome to the OkMap Setup Wizard
This will install OkMap 10.3.0 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

Read the contents of the page and press the *Next* button.

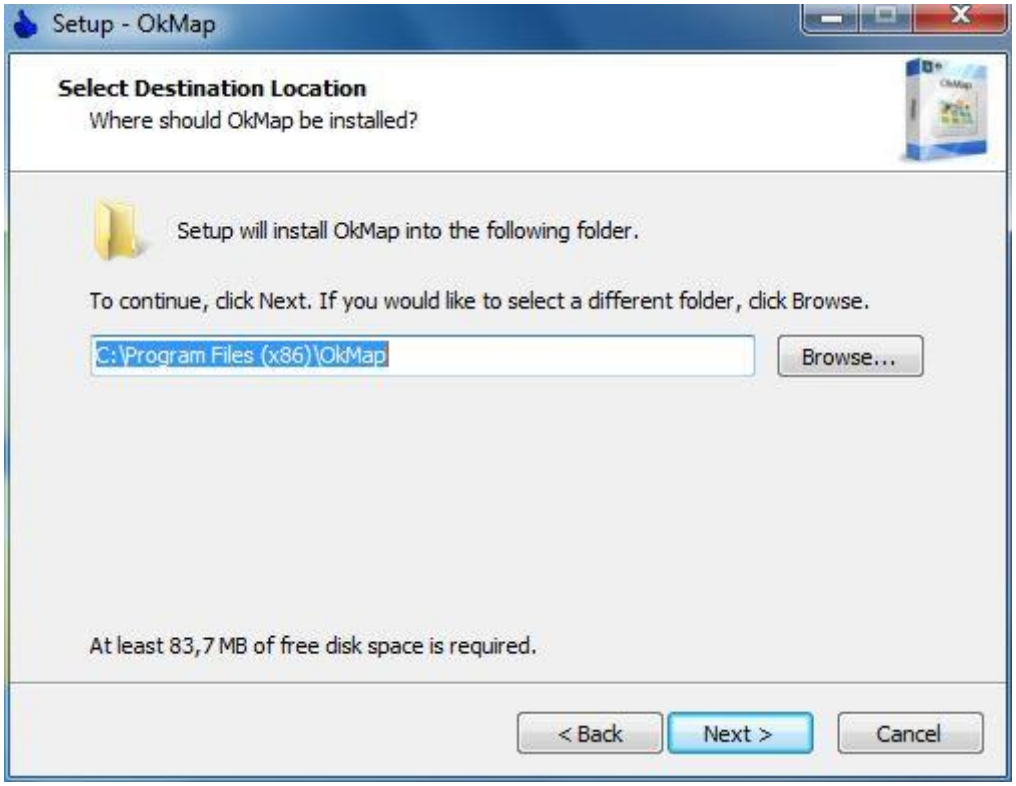
Setup - OkMap
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
OkMap contract
Read carefully the following general conditions.
This license agreement is a legal contract between the User
I accept the agreement
I do not accept the agreement
< Back
Next >
Cancel

First you must carefully read the user agreement and express acceptance (press the *I accept the agreement* option).

Press the *Next* button.


Setup - OkMap
Information
Please read the following important information before continuing.
When you are ready to continue with Setup, click Next.
OkMap - GPS Mapping software
OkMap is a GPS mapping software for tracking and navigation.
For more information visit <http://www.okmap.org> web site.
PLEASE READ THE FOLLOWING!
Prerequisites software:
• Microsoft Windows XP or higher
• Microsoft .NET Framework 3.5 SP1
< Back
Next >
Cancel

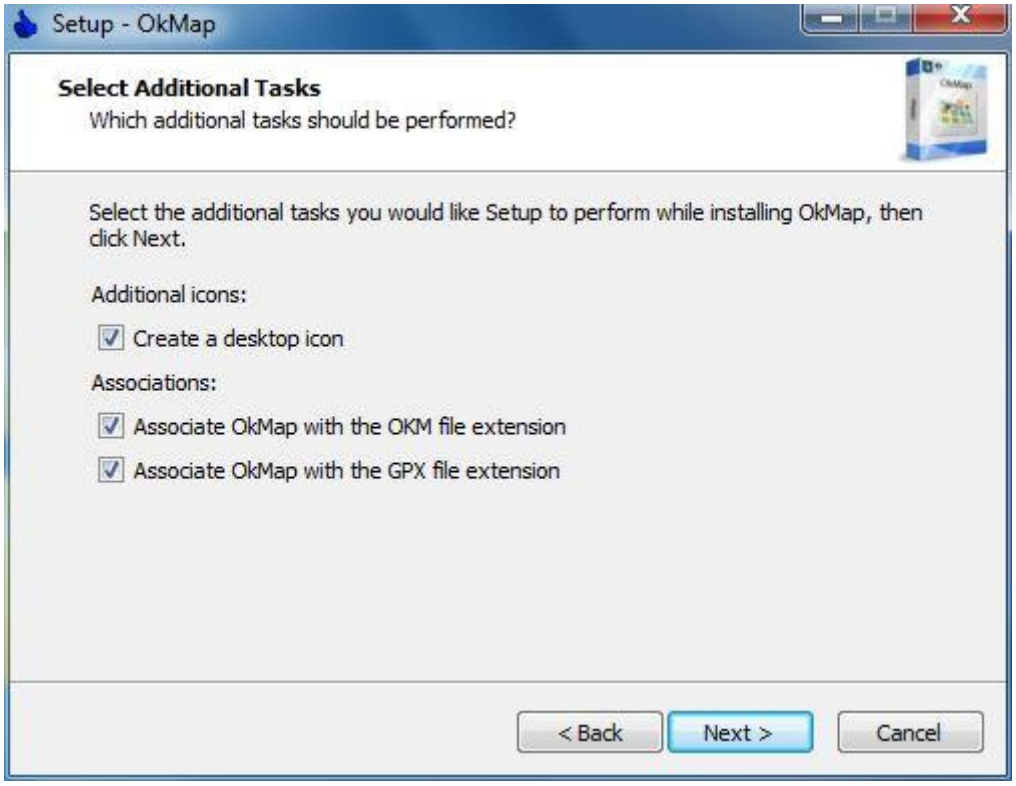
Read carefully the page content, with particular regard to the prerequisites, and press the *Next* button.


Setup - OkMap
Select Destination Location
Where should OkMap be installed?
Setup will install OkMap into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files (x86)\OkMap
Browse...
At least 83,7 MB of free disk space is required.
< Back
Next >
Cancel

In this window you can choose the target directory where install the files.

If you haven't special reasons leave the default suggested by the installer.

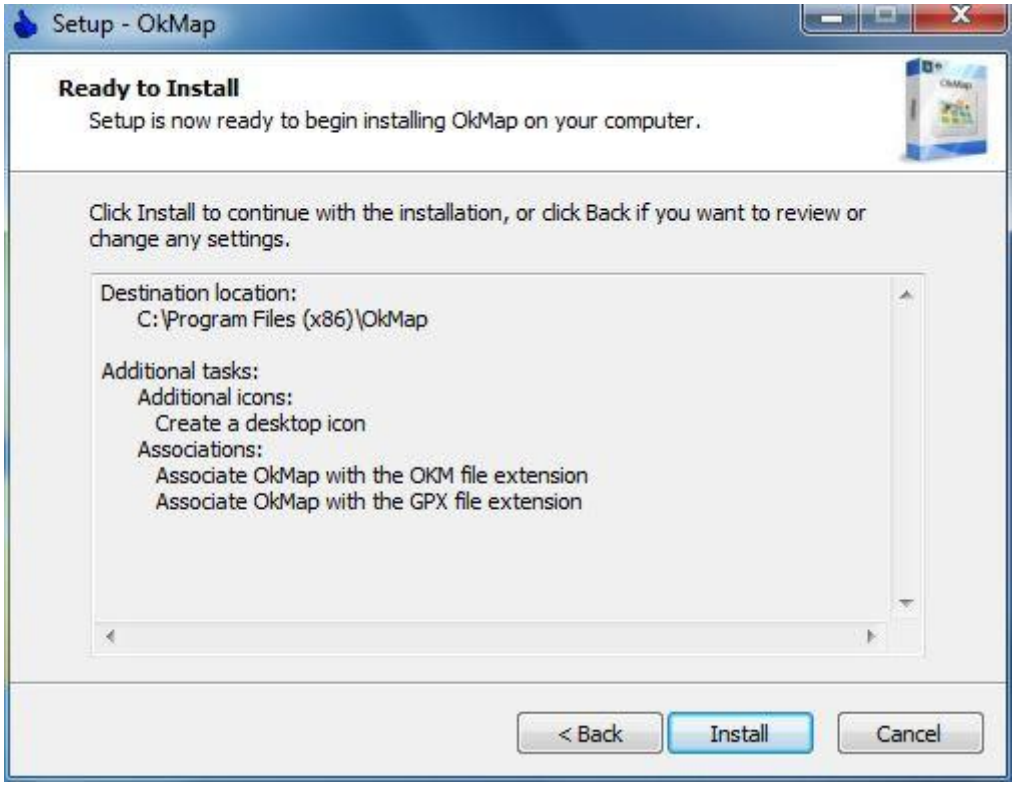
Then press the *Next* button.


Setup - OkMap
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing OkMap, then click Next.
Additional icons:
Create a desktop icon
Associations:
Associate OkMap with the OKM file extension
Associate OkMap with the GPX file extension
< Back
Next >
Cancel

In this window you can select additional tasks to perform:

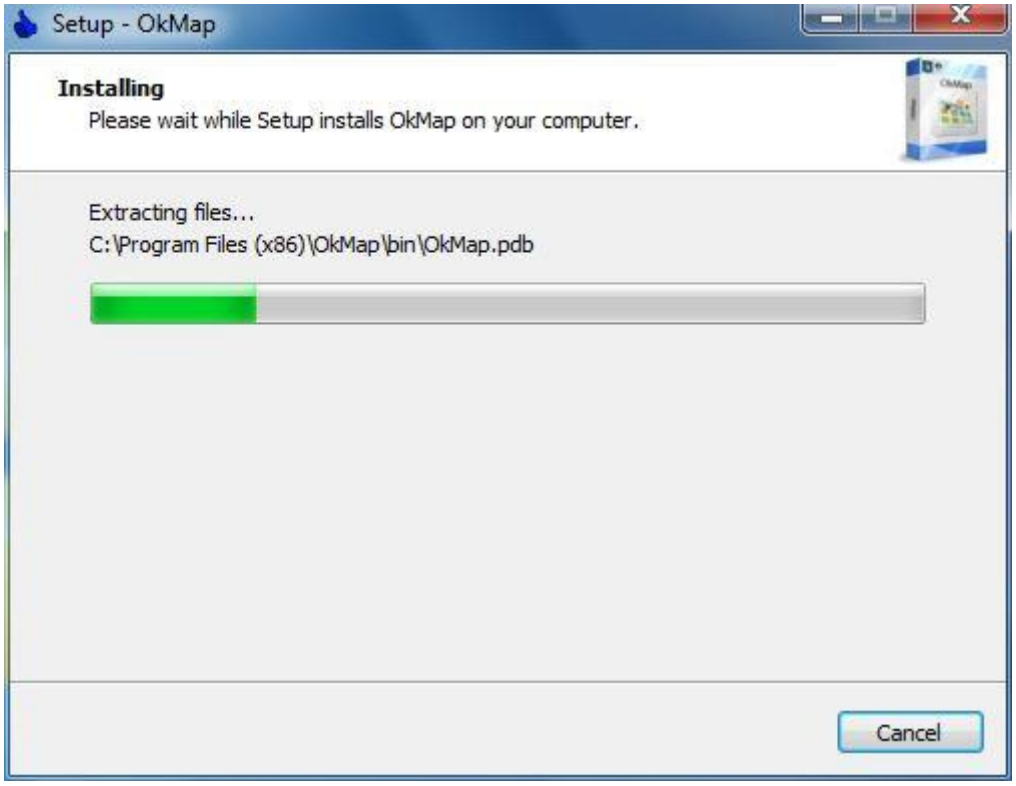
- Create a desktop icon
- Associate to OkMap some file extensions

Then press the *Next* button.


Setup - OkMap
Ready to Install
Setup is now ready to begin installing OkMap on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Program Files (x86)\OkMap
Additional tasks:
Additional icons:
Create a desktop icon
Associations:
Associate OkMap with the OKM file extension
Associate OkMap with the GPX file extension
< Back
Install
Cancel

Check settings and then press the *Install* button.

The program will proceed now to the installation OkMap; the process can take a few moments.




At the end the following window appears:

Setup - OkMap
Completing the OkMap Setup Wizard
Setup has finished installing OkMap on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Launch OkMap
Finish

The program was properly installed.
You can select if lauch OkMap now.
Press the *Finish* button to exit.

The installer will automatically create an entry in *Start - All programs - OkMap*.

## When an error occurs

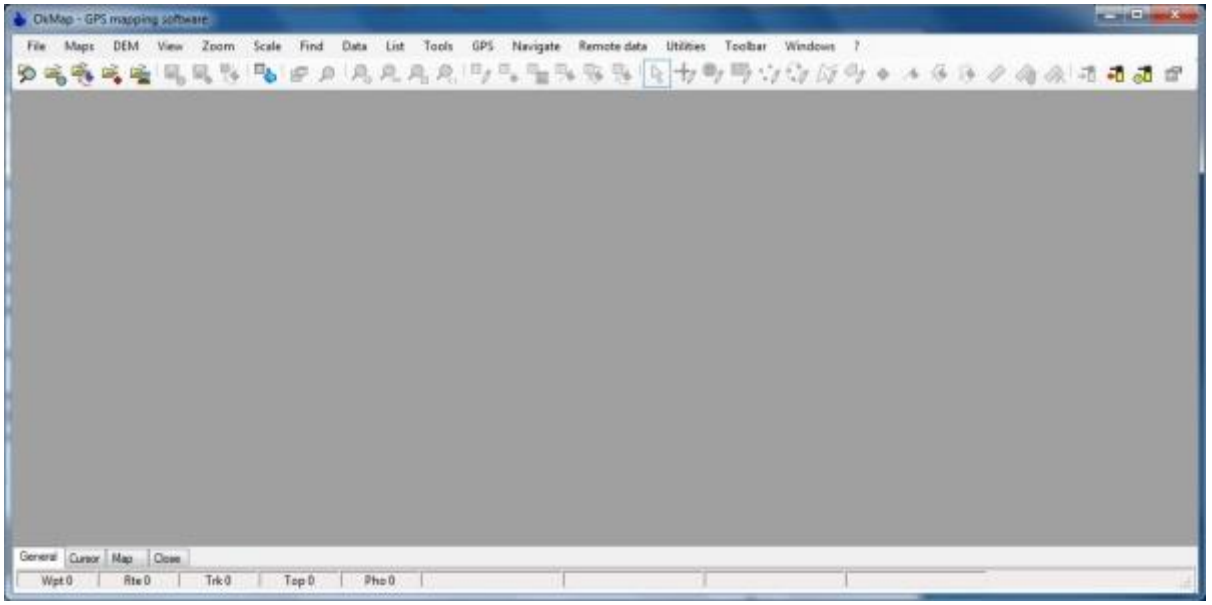
When an error occurs, perform the following steps:

- Make sure you have correctly installed Microsoft Framework 3.5 SP1.
- Delete directories:
  - Windows XP:
    - C:\Documents and Settings\<user>\Impostazioni locali\Dati applicazioni\GianPaoloSaliola
  - Windows 7:
    - C:\Users\<user>\AppData\Local\GianPaoloSaliola
- Reinstall OkMap.

If after these attempts the error persists, please contact us.

# Organization of the screen

## Multi document interface



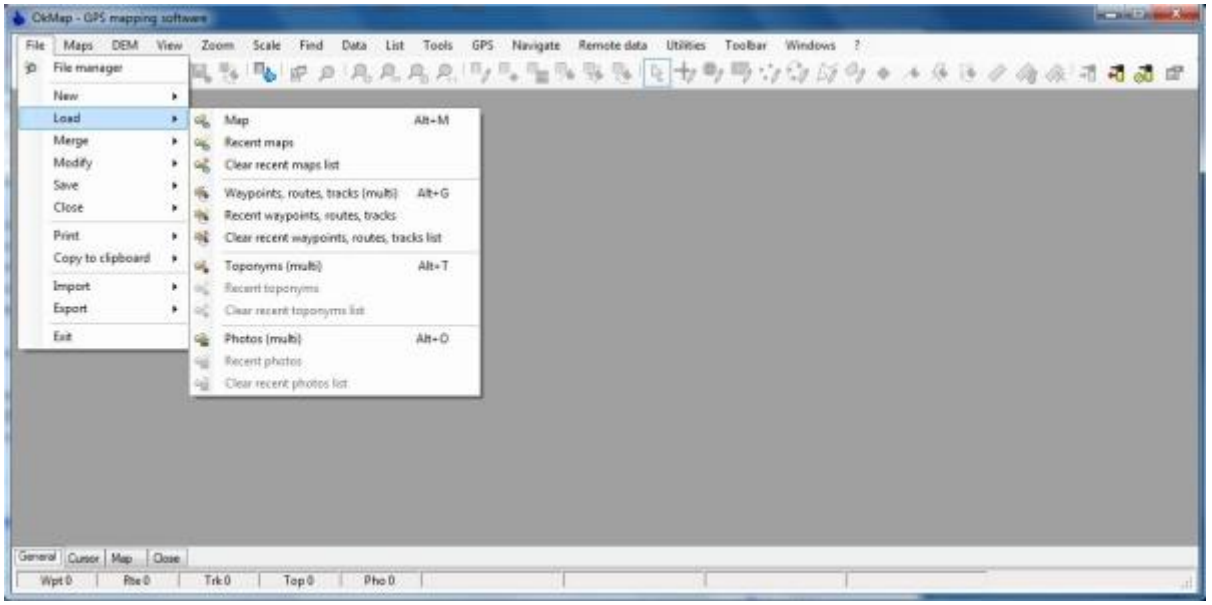
When you activate the program OkMap, it displays its main window. This window serves as a container and host inside another window (multi document interface). OkMap allows working with multiple maps simultaneously.

To open, for instance, a new window map, use the menu *File – Load - Map*.

The windows opened inside the main windows can be "docked".
You can use the mouse to "drag & dock" windows or undock them.

When you close this window, main OkMap automatically closes all windows in it and terminates. Closure of the application may be subject to confirmation as specified in the function Preferences – General.

## Menu




Menu items, generally located above the toolbar, are the usual way to activate the functions of the program.

These items can be grouped into 2 or more levels. The second level is displayed when you click with the left mouse button on the top-level menu system (drop down).

After opening the last level of menu you can activate the corresponding function by clicking the left button of the mouse.

When the menu refers to a function that can be enabled or disabled, a check icon to the left of the menu item is displayed (depending on whether the function is activated or not) with a background of orange color. If the icon is not present, a check mark is shown in its place (only in case of activation).

Some particular functions:

- *View - Auto info*: If enabled, it allows the automatic display of information about an object present on the map (as vectorial or GPX) on which is positioned the mouse.
- *View - Lock objects on map*: If enabled, disables the moving of objects on the map with the mouse.
- *View - Center map on navigation*: If enabled, keeps centered the map during navigation NMEA.
- *View - Redraw*: The purpose is to force the redesign of all objects (vectorial data and GPX) drawn on the map.

## Context menu

Context menu items are activated by clicking the right mouse button in the map.

These items can be grouped on several levels. The second level is displayed when you click with the left mouse button on the top-level menu system (drop down).

After opening the last level of menu you can activate the corresponding function by clicking the left button of the mouse.

When the menu refers to a function that cannot be activated, the text of the menu item is displayed in light color.

Activated functions may concern:

- The single subject on which you place the mouse pointer
- All the selected objects of a type
- All the selected objects
- All the objects of a type
- All the object
- The point on the map where is located the mouse

## Toolbar

OkMap - GPS mapping software
File Maps DEM View Zoom Scale Find Data List Tools GPS Navigate Remote data Utilities Toolbar Windows ?

The toolbar is a convenient shortcut to activate the program functions as an alternative to the menu items.

There are as many toolbars as are the main items of the menu (level 1).

The toolbars contain some images (icons) that correspond to as many menu items. Each icon represents a function that can be activated by clicking on it with the left mouse button.

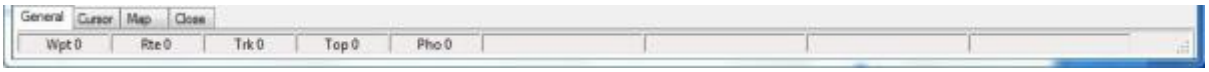
Placing the mouse for at least 2 seconds on an icon, appears the description of the corresponding function (tooltip).

The toolbars can be displayed or not using the *Toolbar* menu item.

The toolbars can be moved by dragging with the left mouse button; when the application ends, the position of the toolbars is saved, and proposed the next time.

The menu item *Toolbar - Reset* replaces the toolbars in the positions saved the last time. The menu *Toolbar – Default* replaces the toolbars in the original position (the ones proposed for a new installation of OkMap).

## Status bar




The status bar is positioned in the underside of the main window and is used to display some indicators.

The status bar is divided into three tabs and all the indicators inside are read-only.

Placing the mouse for at least 2 seconds on an indicator, appears the meaning description (tooltip).

The first tab contains the following indicators:

- Number of loaded waypoints
- Number of loaded routes
- Number of loaded tracks
- Number of loaded toponyms
- Number of loaded photos
- The remote data receiving status by OkMap server (receiving / not receiving)
- The last position sent to an OkMap remote server

- The remote GpsGate.com receiving status (receiving / not receiving)
- The remote data receiving status by GpsGate.com server

The second tab contains the following indicators:

- Size of the current map in pixels
- Position of the mouse pointer in pixel (X and Y)
- Reference Datum
- UTM zone on the mouse pointer
- Longitude and latitude of the mouse pointer (express in the form specified in the function Preferences-General)
- Alternative grid East and north coordinates of the mouse pointer
- Altitude of the mouse pointer (1) (the unit of measurement is expressed as specified in the function Preferences–Distance, area)

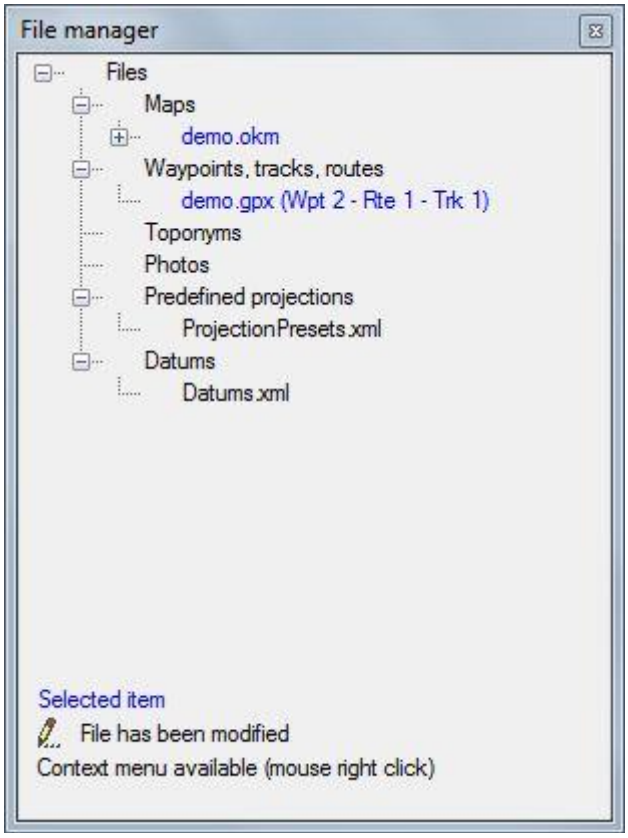
The third tab contains the following indicators:

- Size of the current map in pixels
- Reference Datum
- Projection used by map
- Center of longitude and latitude (express in the form specified in the function Preferences-General)
- Zoom Factor (%) for raster maps or scale (meters / pixel) for vectorial maps
- Calculated distance between various points with the tool *Distance* (the unity of measure is express according to what specified in the function Preferences – Distance. area)
- Calculated area of a polygon formed by the points specified with the tool *Area* (the unity of measure is express according to what specified in the function Preferences Distance,area)

(1) - the altitude is shown only if in the folder ..\OkMap\data\dem has been placed the DEM (digital earth model) data files in SRTM-1 or SRTM-3 format (file with extension "hgt"). The DEM data can be automatically downloaded provided you have an internet connection (v. Download DEM data).

## File manager

It’s an utility function to manage opened files.




The file types are:

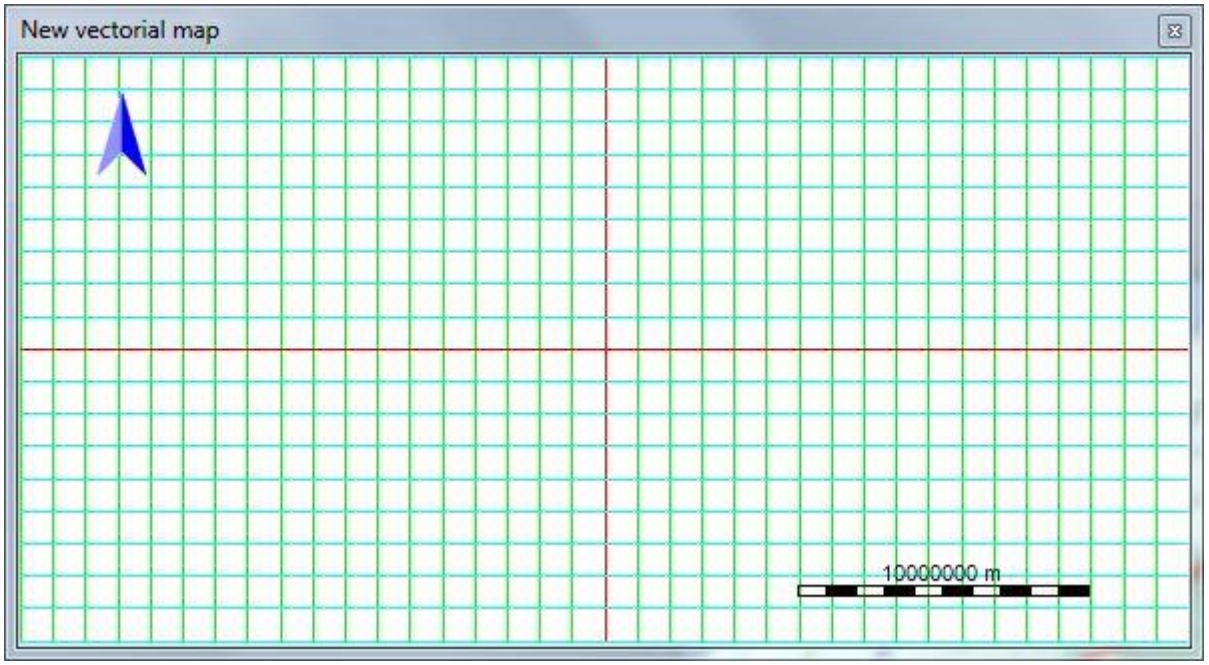
- Maps
- Waypoints, routes, tracks
- Toponyms
- Photos
- Predefined projections (one system file)
- Datum (one system files)

The item listed can be expanded or collapsed to simplify reading.

The selected files are colored in blue while the icon underline the modified files.

There is a context menu specialized for each file type and single file.

## Area map



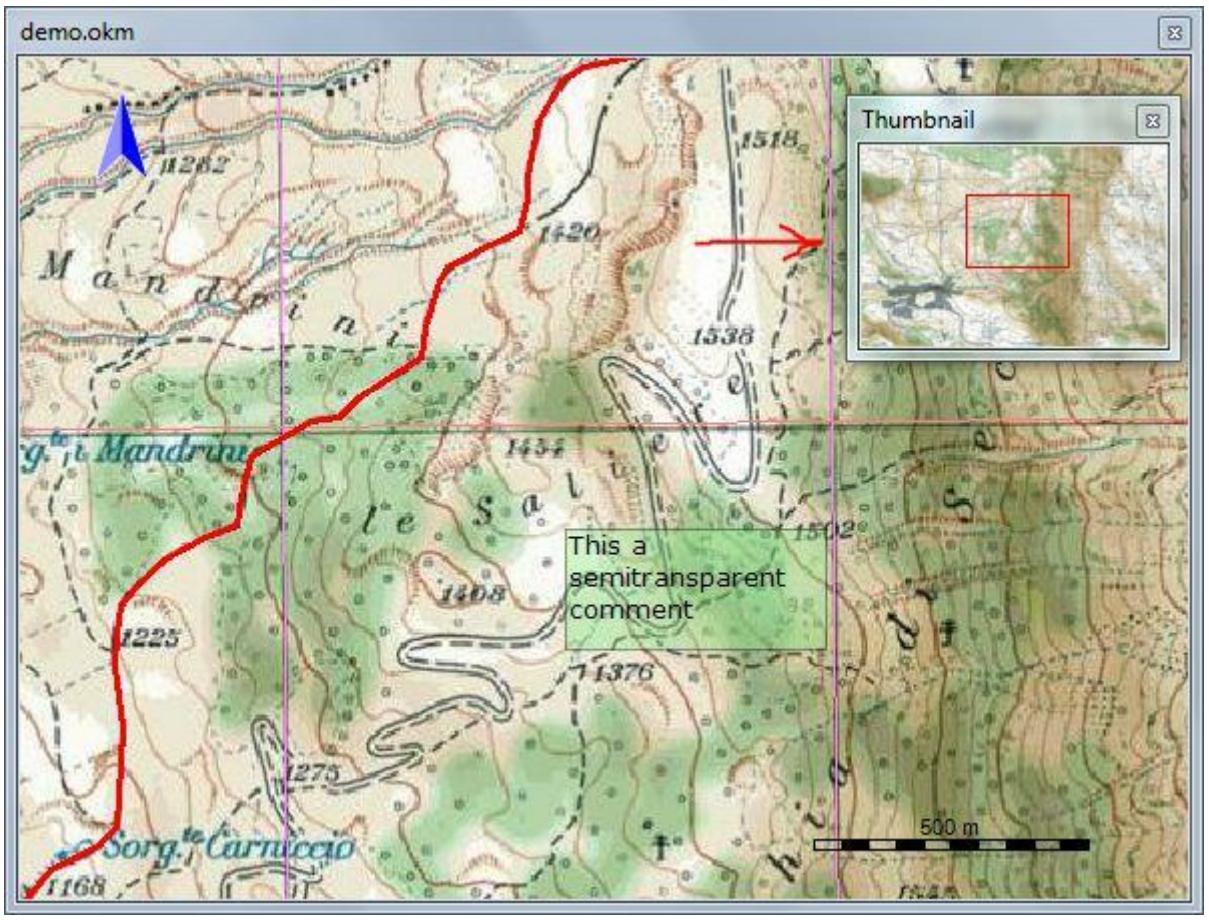

The area map is the central part of the main window and is used to display the map.

The functions, that can be activated in this area by the mouse, depend on the selected tool in the Tools menu. It is possible to perform operations as objects selection, moving the map (panning), zooming the map, creating vectorial objects and GPX, calculating distances and areas, and other functions.

In this area it's possible to display a bitmap representing the north direction of the map (top-left position) and the map scale (bottom-right position).

Clicking the right mouse button will activate the context menu.

## Mini map




The mini map is used to display the full image of the map in a small window (thumbnail).

It constitutes an overview and a valuable aid for panning (moving the main map).

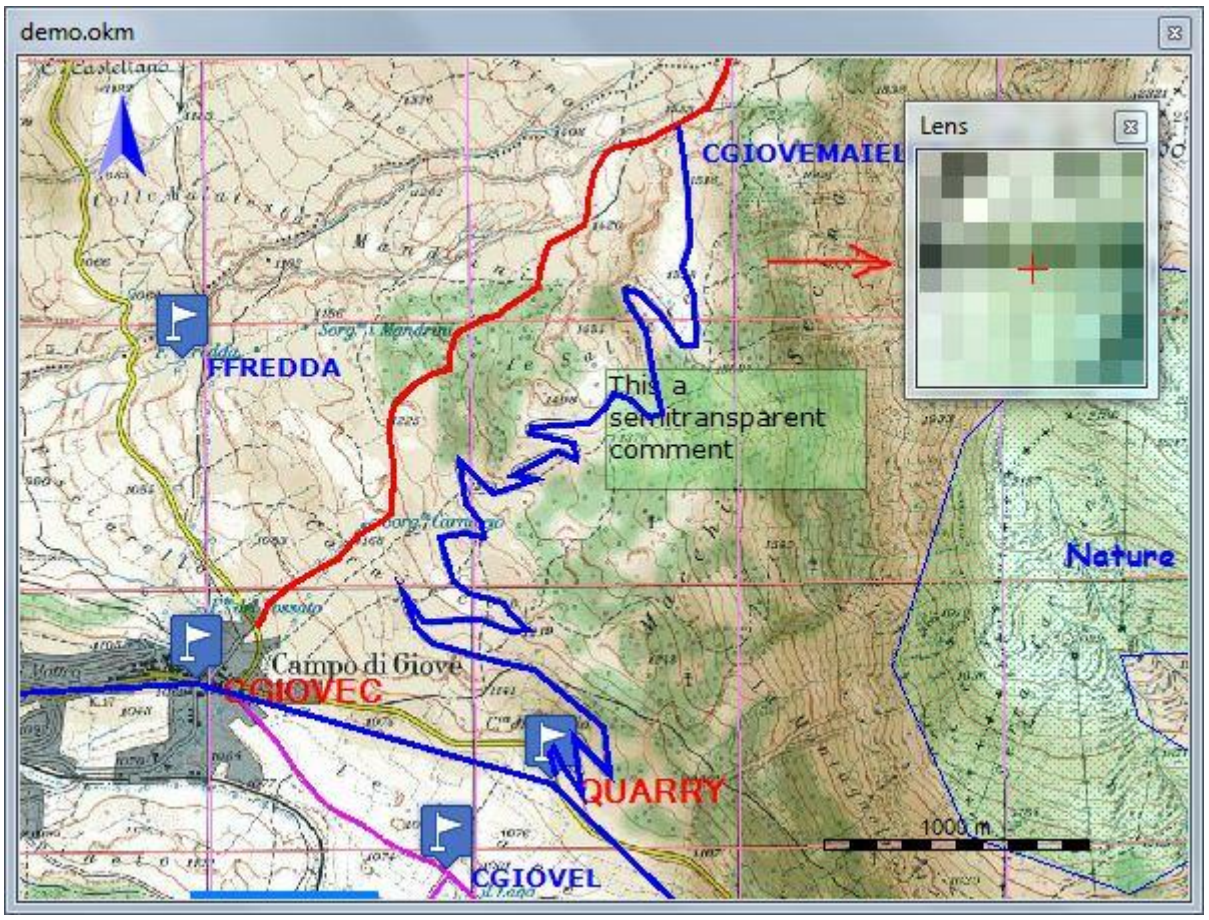
It can be viewed only in case of raster map.

To display / hide the mini map use the menu *View* - *Thumbnail*.

By clicking the left button of the mouse, on a point on the mini map, you will get moving (panning) of the main map, in order to view this point in the middle of the screen.

A rectangle of red color, displayed within the mini map, identifies the portion of the map displayed in the main area. Obviously the size of the rectangle depends on the zoom factor selected.

## Lens




The lens is used to view an enlarged image of the map in the neighborhood of the mouse pointer.

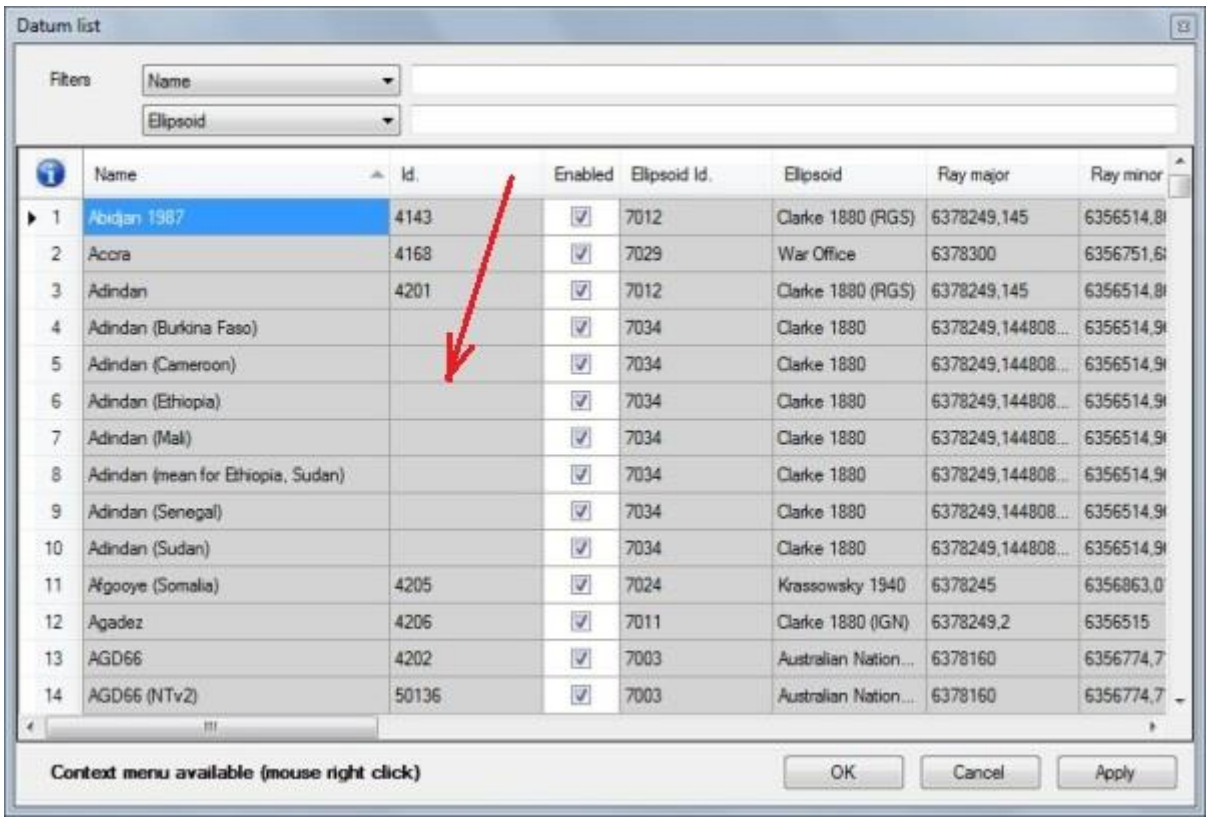
It is an aid to precision operations such as then calibration of a raster map or the creation of a waypoint.

Can be viewed only in case of raster map.

To display / hide the mini map use the *View* - *Lens* menu.

Moving the mouse pointer in the main area of the map, the window will automatically display the mini map zoomed around that point.

## Data tables


Datum list
Filters
Name
Ellipsoid
Name
Id.
Enabled
Ellipsoid Id.
Ellipsoid
Ray major
Ray minor
1 Abidjan 1987 4143 7012 Clarke 1880 (RGS) 6378249,145
2 Accra 4168 7029 War Office 6378300
3 Adindan 4201 7012 Clarke 1880 (RGS) 6378249,145
4 Adindan (Burkina Faso) 7034 Clarke 1880 6378249,144808...
5 Adindan (Cameroon) 7034 Clarke 1880 6378249,144808...
6 Adindan (Ethiopia) 7034 Clarke 1880 6378249,144808...
7 Adindan (Mali) 7034 Clarke 1880 6378249,144808...
8 Adindan (mean for Ethiopia, Sudan) 7034 Clarke 1880 6378249,144808...
9 Adindan (Senegal) 7034 Clarke 1880 6378249,144808...
10 Adindan (Sudan) 7034 Clarke 1880 6378249,144808...
11 Afgooye (Somalia) 4205 7024 Krassowsky 1940 6378245
12 Agadez 4206 7011 Clarke 1880 (IGN) 6378249,2
13 AGD66 4202 7003 Australian Nation... 6378160
14 AGD66 (NTv2) 50136 7003 Australian Nation... 6378160
Context menu available (mouse right click)
OK
Cancel
Apply

To represent lists of structured information is often used tables or grids of data. The table would consist of the following parts:

- A header consisting of several cells containing the column headings.
- A central body containing the cells belonging to different rows and columns of the table.
- The first column contains the line numbers (not editable).
- A possible last line where you can insert new elements (if the insertion is a function provided in that context).
- A vertical scroll bar to the right of the table and displayed only if the number of rows exceeds the visible space available.
- A horizontal scroll bar at the base of the table and displayed only if the number of
- columns exceeds the visible space available.

Some fields are editable while non-editable fields are highlighted with a gray background.

Above the data tables often appear some fields (usually one or two) that allow you to filter the data shown in the below table rows.

To filter the data is sufficient to choose the column to filter in the combo box and type, in the adjacent field, the value to use as filter (inside value).

To scroll the table vertically using the vertical scroll bar to the right of the table itself, or use the mouse wheel.

To scroll the table horizontally and then displays the columns to the right of the table, use the horizontal scroll bar at the base of the table.

To insert new elements (if any) scroll the table vertically and go to the last blank line designed for that purpose.

To change the display order of the rows click with the left mouse button on the head of the table at the column for which you want to get the sort of rows; a further click will change the sort order alternately from ascending to decreasing.

To change the display order of columns, click the left mouse button on the heading of the column you want to move; then drag the heading cell in the desired position and then release the mouse button.

To select a row click the left mouse button on the column containing the line numbers in the row to be selected; holding down the Ctrl key you can add additional rows to your selection; holding down the Shift key you can select rows between the current line and the previously selected line.

To select all rows simply click with the left mouse button on the heading of the column containing the row numbers.

Selected lines can be copied to the clipboard using the button *Cntr+C*. Lines copied can be pasted into an editor or a spreadsheet.

To delete the selected rows (if any) press the *Canc* key; the program will ask for confirmation before proceeding with deleting.

To increase or decrease the width of a column position the mouse on the heading of the table at the end of the column you want to resize; a sizing cursor will be displayed; hold the left mouse button and drag the end of column left (enlargement) or right (narrowing); so, at the size desired, release the mouse.

To restore the size of columns in the native state press the right mouse button at the table and choose context menu *Default grid layout*.

To increase or to decrease the height of a row position the mouse on the first column of the table (line number) at the end of the line you want; a sizing cursor will be displayed; hold the left button the mouse and drag the end of the row down (enlargement) or upwards (narrowing); so, at the size desired, release the mouse.

# Datum

## The shape of the Earth

The shape of the Earth can be approximated, in an ever more precise, to:

- A sphere.
- An ellipsoid or spheroid (ellipsoid of revolution): that can be mathematically defined by the semi-major axis and the flattening at the poles.
- A geoid: that would coincide with the surface of the sea if he ranges widely over the planet with the same density and temperature and in absence of disturbances due to winds and tidal currents.

## Datum definition

A datum defines a system of coordinates through:

- The ellipsoid of reference (semi-major axis and flattening).
- The position of the ellipsoid from the center of the Earth (3 spatial coordinates: x, y, z).

Each reference ellipsoid takes a specific name (e.g.: Bessel 1841, Clarke 1866, International 1924, WGS84, etc.).

There are many datum reference because:

- Historically there has never been need of an universal univocal system.
- Some datum allow you to maximize the accuracy locally.

Several datum can refer to the same ellipsoid. What distinguishes these datum is the position of the ellipsoid to the center of the Earth. These datum are used in various regions to achieve greater accuracy in the local area.

Even the datum are defined with a unique name that recalls the name of the ellipsoid and the region where they are required, such as *South American 1969 (Brazil)*.

In recent years it has felt the need to establish an international datum (WGS84) with origin at the center of the Earth (x=y=z=0).

## Coordinate systems

The **spherical coordinates** are measured in **latitude** and **longitude**. These angles are measured in degrees from the center of the earth to a point on the surface.

The latitude varies from the north pole (90) decreases to the Equator (0) and decreasing further to the south pole (-90).

The longitude varies from the Greenwich meridian (0) growing towards the east to the meridian opposite (180) and decreases towards the west to the same meridian opposite (-180).

When you express the spherical coordinates is always necessary to indicate the reference datum because different datum provide different coordinates for the same point.

A direct projection transforms a spherical coordinates system in a Cartesian coordinate system, while a reverse projection makes the opposite.

**Cartesian coordinates** are based on a system of two orthogonal axes (x, y). The location of a point is given by the intersection of the two values.

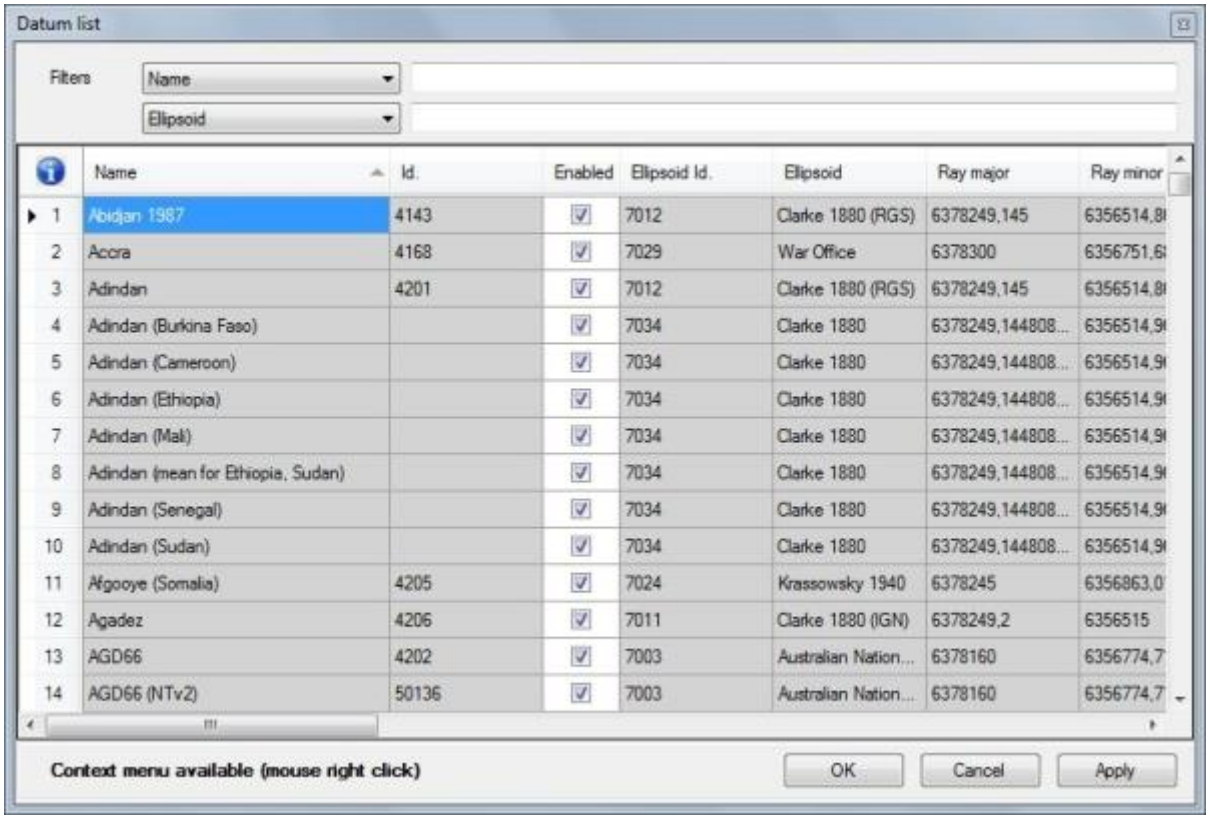
## List the datum

It is a function able to produce a list of the available datum in OkMap and their characteristics.

With this function you can disable some elements in order to get a more contained list in all the circumstances in which you must select a datum.

The information displayed in this window are:

- Datum name
- Datum Id. (EPSG database)
- Enabled / Disabled
- Reference Ellipsoid
  - Ellipsoid Id. (EPSG database)
  - Ellipsoid name
  - Major radius of the Earth
  - Minor radius of the Earth
  - Inverse flattening
  - Flattening
  - Eccentricity
  - Eccentricity sec.
- Ellipsoid position towards the center of the earth
  - Shift X (meters)
  - Shift Y (meters)
  - Shift Z (meters)
  - Rotation X (seconds)
  - Rotation Y (seconds)
  - Rotation Z (seconds)
  - Scaling (ppm)


Datum list
Filters
Name
Ellipsoid
Name
Id.
Enabled
Ellipsoid Id.
Ellipsoid
Ray major
Ray minor
1 Abidjan 1987 4143 7012 Clarke 1880 (RGS) 6378249,145
2 Accra 4168 7029 War Office 6378300
3 Adindan 4201 7012 Clarke 1880 (RGS) 6378249,145
4 Adindan (Burkina Faso) 7034 Clarke 1880 6378249,144808...
5 Adindan (Cameroon) 7034 Clarke 1880 6378249,144808...
6 Adindan (Ethiopia) 7034 Clarke 1880 6378249,144808...
7 Adindan (Mali) 7034 Clarke 1880 6378249,144808...
8 Adindan (mean for Ethiopia, Sudan) 7034 Clarke 1880 6378249,144808...
9 Adindan (Senegal) 7034 Clarke 1880 6378249,144808...
10 Adindan (Sudan) 7034 Clarke 1880 6378249,144808...
11 Afgooye (Somalia) 4205 7024 Krassowsky 1940 6378245
12 Agadez 4206 7011 Clarke 1880 (IGN) 6378249,2 6356515
13 AGD66 4202 7003 Australian Nation... 6378160
14 AGD66 (NTv2) 50136 7003 Australian Nation... 6378160
Context menu available (mouse right click)
OK
Cancel
Apply

To activate this function use the menu *List - Datum*.

To enable or disable a datum, click on the *Enabled* column in the row on the datum to be modified, a checkmark will indicate if the row is active or not.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

For more information about the general use of tables, see the topic Data tables.

## Add custom datum

OkMap has a large number of predefined datum and normally should not be asked to define your own.

In every case, if the user wants to add datum not in the list, he may do so by changing a definition file OkMap.

For more information on obtaining a list of datum see the topic List the datum.

**CAUTION** the following procedure is for the exclusive use of advanced users because it can determine the improper functioning of OkMap.

To add a new datum with an editor modify the following definition file:
C:\Documents and Settings\"utente"\Dati applicazioni\GianPaoloSaliola\OkMap\"versione"\defs\Datums.xml.

**CAUTION** before you edit the file make a backup copy because if the changes are not correctly made, OkMap during start-up will cause an irreversible error.

Go to the end of the file and before the closing end tag */datums*, insert, copying it from a existent datum, all the rows between the tags (including) *datum* and */datum*. Then change the contents being careful to give a unique name for the new datum worth the incorrect operation of OkMap. **CAUTION** Use the decimal point in U.S. notation.

At the end of the changes save the file and relaunch OkMap. If the system does not start, restore the backup file made previously using the original name

If OkMap still does not work probably the repaired file is not correct. You can still solve the problem uninstall and reinstall OkMap.

**WARNING** Each time you reinstall OkMap your customizations will be lost. Store, in a folder, a file containing your custom datum so they can reenter after you reinstall a new OkMap version.

# Default projections/datum

## What is a projection

A projection of a cartographic map is a mathematical formula used to convert the three-dimensional shape of the earth's surface in a two-dimensional shape as a map (direct projection) and back (reverse projection).

## Classification according to spatial properties

Since the earth's surface is curved, the process of projection distorts always one or more of the following spatial properties:

- areas
- distances
- angles

There are many types of projection each of one capable of representing one or more spatial properties but not all at once.

The projections are grouped into categories according to the spatial properties that are able to represent:

- **Equivalent or Equal-area**: the areas of all regions are represented in the same proportion of the original surface, e.g. maintain the relationship between the surfaces. Shapes, angles and dimensions are distorted in most areas of the map.

- **Equidistant**: maintain a constant scale along all the great circles (the shortest distance between two points). No projection can be both equivalent and equidistant because the requirements of scale for compliance and for the equivalence are
contradictory.

- **Conforming or isogonic or orthomorfic**: preserves angles. The compass rose is the same in every point on the surface of the globe (except the poles). It is impossible that a projection is both conform and equivalent.

## Classification according to geometric principles

The projections are further classified based on geometric principles on which they are based:

- **Perspective**: they are obtained by a plane tangent to the sphere at any point of the same and by the variation of the observation point, are distinguished in:
  - **Centrographic**: the point of observation coincides with the center of the sphere and projected on the plane of polar gnomonic map.
  - **Stereographic**: the observation point is on the surface of the sphere opposite to the projection plane.
  - **Orthographic**: infinity and is projected on the tangent plane at the opposite pole.

- **Conic**: are made by projecting the points of the sphere on a cone tangent to a parallel.
- **Cylindrical**: are obtained by wrapping the globe with a cylinder tangent to the equator.
- **Mathematics**: are used to realize small scale maps and representing the entire surface of the Earth in the form of circles, ovals or other shapes also interrupted.

## Most used projections

Here is a list of most used map projections and their scope of use (the list is alphabetical and not in order of importance):

- **Albers Equal-area Conic**: Equivalent, Conic. Used for large regions that extend from east to west.
- **Equidistant Conic**: Equidistant, Conic. Used for mid latitudes and small regions. **Lambert Azimuthal Equal-area**: Equivalent, azimuthal. Used for the polar regions.
- **Lambert Conformal Conic**: Conforming, Conic. Used for large regions that extend from east to west.
- **Mercator**: Conforming, Cylindrical. Used for the regions bordering the equator. Useful because the nautical lines are straight.
- **Miller**: Cylindrical, not Conforming not Equivalent. For atlases and maps that require little distortion near the polar regions.
- **Oblique Mercator**: Conforming, Cylindrical. Used for areas that extend obliquely so the equator.
- **Orthographic**: Azimuthal, not Conforming not Equivalent. Used to produce a view of Earth seen from space.
- **Robinson**: Pseudocylindrical, not Conforming not Equivalent. Mainly used for the production of atlases.
- **Sinusoidal**: Pseudocylindrical, Equivalent. Used for large areas (Africa, South America) which has a north-south extension.
- **Stereographic**: Azimuthal, Conforming. Used for the polar regions.
- **Transverse Mercator**: Cylindrical, Conforming. Used mainly in the region that extends north-south.

## Projections used according to the scale

Here is a list of projections that are most appropriate for use according to the scale to be adopted:

- **World**: Mercator, Miller and Robinson.
- **Hemisphere**: Lambert Azimuthal Equal-area and Stereographic
- **Continent, oceans and regions**: Albers Equal-area Conic, Equidistant Conic (Simple Conic), Lambert Azimuthal Equal-area, Lambert Conformal Conic, Stereographic, and Transverse Mercator
- **Medium and large scale**: Lambert Conformal Conic, Stereographic and Transverse Mercator

## Usable projections with OkMap

OkMap currently implements the following projections:

- Longitude / Latitude
- Mercator
- Mercator 2SP
- Mercator (Spherical)
- Transverse Mercator
- Oblique Mercator
- Hotine Oblique Mercator
- Lambert Conformal Conic
- Lambert Conformal Conic 2SP
- Albers Conical Equal Area
- Orthographic
- Cassini-Soldner
- Bonne

## Projection parameters

The mathematical models that are based on map projections are characterized by a set of parameters that define how to transform coordinates in Cartesian coordinates.

The type and the number of the parameters depend on the projection in question. The following chart illustrates the parameters for all the projections used in OkMap.

| Projection | x0 | y0 | lam0 | phi0 | k0 | azim | bear | phi1 | phi2 |
|---|---|---|---|---|---|---|---|---|---|
| Longitude / Latitude | x | x | x | x | | | | | |
| Mercator | x | x | x | x | x | | | | |
| Mercator 2SP | x | x | x | x | | | | x | |
| Mercator (Spherical) | x | x | x | x | | | | | |
| Transverse Mercator | x | x | x | x | x | | | | |
| Oblique Mercator | x | x | x | x | x | x | x | | |
| Lambert Conformal Conic | x | x | x | x | x | | | | |
| Lambert Conformal Conic 2SP | x | x | x | x | x | | | x | x |
| Orthographic | x | x | x | x | | | | | |
| Cassini-Soldner | x | x | x | x | x | | | | |
| Bonne | x | x | x | x | | | | | |

where:

| Parameter | Description |
|---|---|
| x0 | False East / Linear value applied to the origin of the coordinate x |
| y0 | False North / Linear value applied to the origin of the coordinate y |
| lam0 | Central meridian - Longitude of the origin of the map (-180, 180) |
| phi0 | Central parallel - Latitude of the origin of the map (-90, 90) |
| k0 | Scale factor at the central meridian (0.1, 1.0) |
| azim | Azimuth of the line that passes through the center of projection (-90, 90) |
| bear | Direction of the center of the line (-90, 90) |
| phi1 | First standard parallel (-90, 90) |
| phi2 | Second standard parallel (-90, 90) |

## List the default projections/datum

It is a function able to produce a list of the predefined projections / datum in OkMap and their characteristics.

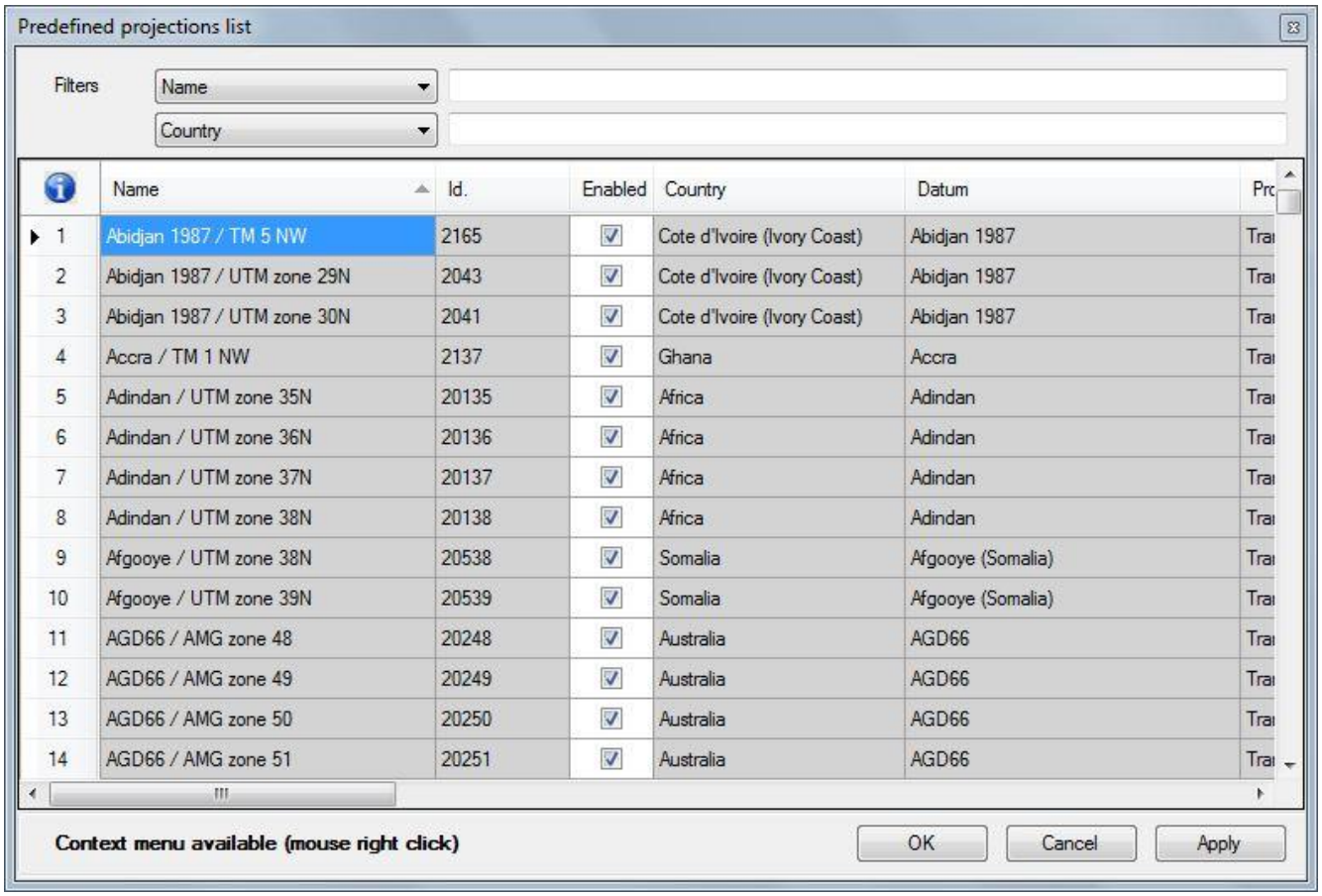
This list represents the set of projections / datum most commonly used in the compilation of maps and is made available to the user to make ease the task of georeferencing of raster maps.

With this function you can disable some elements in order to get a more contained list in all the circumstances in which you must select a default projection / datum.

The information displayed in this window are:

- Predefined projection / datum name
- Predefined projection / datum Id. (EPSG database)
- Enabled / Disabled
- Country
- Projection name
- False east
- False north
- Center of the longitude
- Center of the latitude

- Scale factor x
- Scale factor y
- Center line azimuth
- Center line bearing
- First standard latitude
- Second standard latitude




| | Name | Id. | Enabled | Country | Datum | Pr |
|---|---|---|---|---|---|---|
| 1 | Abidjan 1987 / TM 5 NW | 2165 | ☑ | Cote d'Ivoire (Ivory Coast) | Abidjan 1987 | Tra |
| 2 | Abidjan 1987 / UTM zone 29N | 2043 | ☑ | Cote d'Ivoire (Ivory Coast) | Abidjan 1987 | Tra |
| 3 | Abidjan 1987 / UTM zone 30N | 2041 | ☑ | Cote d'Ivoire (Ivory Coast) | Abidjan 1987 | Tra |
| 4 | Accra / TM 1 NW | 2137 | ☑ | Ghana | Accra | Tra |
| 5 | Adindan / UTM zone 35N | 20135 | ☑ | Africa | Adindan | Tra |
| 6 | Adindan / UTM zone 36N | 20136 | ☑ | Africa | Adindan | Tra |
| 7 | Adindan / UTM zone 37N | 20137 | ☑ | Africa | Adindan | Tra |
| 8 | Adindan / UTM zone 38N | 20138 | ☑ | Africa | Adindan | Tra |
| 9 | Afgooye / UTM zone 38N | 20538 | ☑ | Somalia | Afgooye (Somalia) | Tra |
| 10 | Afgooye / UTM zone 39N | 20539 | ☑ | Somalia | Afgooye (Somalia) | Tra |
| 11 | AGD66 / AMG zone 48 | 20248 | ☑ | Australia | AGD66 | Tra |
| 12 | AGD66 / AMG zone 49 | 20249 | ☑ | Australia | AGD66 | Tra |
| 13 | AGD66 / AMG zone 50 | 20250 | ☑ | Australia | AGD66 | Tra |
| 14 | AGD66 / AMG zone 51 | 20251 | ☑ | Australia | AGD66 | Tra |

To activate this function use the menu *List - Presets*.

To enable or disable a predefined projection / datum, click on the *Enabled* column in the row on the datum to be modified, a checkmark will indicate if the row is active or not.

Some lines are not activated because the corresponding projection is not implemented in OkMap.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

For more information about the general use of tables, see the topic Data tables.

## Add custom projections/datum

OkMap has a large number of predefined projections / datum and normally should not be asked to define your own.

In every case, if the user wants to add projections / datum not in the list, he may do so by changing a definition file OkMap.

For more information on obtaining a list of predefined projections / datum see the topic List the projections/datum.

**CAUTION** the following procedure is for the exclusive use of advanced users because it can determine the improper functioning of OkMap.

To add a new projection / datum with an editor modify the following definition file: C:\Documents and Settings\"user"\Dati applicazioni\GianPaoloSaliola\OkMap\"versione"\defs\ProjectionPresets.xml.

**CAUTION** before you edit the file make a backup copy because if the changes are not correctly made, OkMap during start-up will cause an irreversible error.

Go to the end of the file and before the closing end tag */projectionPresets*, insert, copying it from a existent projection / datum, all the rows between the tags (including) *projectionPreset* and */projectionPreset*. Then change the contents being careful to give a unique name for the new projection / datum worth the incorrect operation of OkMap. You must use an existing projection and an existing datum. **CAUTION** Use the decimal point in U.S. notation.

At the end of the changes save the file and relaunch OkMap. If the system does not start, restore the backup file made previously using the original name

If OkMap still does not work probably the repaired file is not correct. You can still solve the problem uninstall and reinstall OkMap.

**WARNING** Each time you reinstall OkMap your customizations will be lost. Store, in a folder, a file containing your custom datum so they can reenter after you reinstall a new OkMap version.

# Maps

## Types of maps

Cartographic programs can be divided into two categories: those that use georeferenced vectorial cartography, usually purchased on a CD (vectorial maps) , and those that use a graphic file (.tif,. jpg,. bmp etc..), purchased or obtained by scanning a paper map and then properly georeferenced or calibrated (raster maps).

OkMap can use both the types of maps, even simultaneously.

Raster map includes a digital image of a map previously submitted to a process of calibration (georeferencing). The calibration process allows you to store additional information to the image of the map so that OkMap can always learn, according to the coordinates in pixels, the real coordinates relative and vice versa.

The calibration of a raster map can be made as long as you know:

- the projectionsystem used for drawing the map and the relative parameters (e.g. center of the projection, etc.)
- the map datum
- the correspondences between the absolute coordinates of the map (in pixel) and the geographical coordinates of at least 2 points (preferably 3 or more)

Raster maps can be used as background for the representation of waypoints (points of interest), routes and tracks and as background for navigation.

Vectorial maps means a rectangle of some size on which to draw a certain amount of vectorial data (points, lines, polygons) that represent a specific territory in its various forms (dividing lines, rivers, lakes, roads, etc..).

The creation of a vectorial map needs to know:

- the projectionsystem used for drawing the map and the relative parameters (e.g. center of the projection, etc.)
- the map datum
- the scale factor (e.g. meters for pixel)

Vectorial maps can be used, like the raster maps as background for the representation of waypoints (points of interest), routes, tracks and as background for navigation.

## Calibrate a raster map

The calibration of a raster map is the process of georeferencing which enables the software to know the geographical coordinates of any point (expressed in pixel coordinates) of the image of the map and vice versa.

A video is available for this function.

The method provides for the transformation of coordinates into distances from the center of the map (expressed in meters) and then solving a system of linear equations that determine the calibration coefficients of the map.

The method of transformation of coordinates used and the number of coefficients determined, depend on the number of points suggested in the calibration of the map.

OkMap uses the following methods:

- **similarity** - when two points of calibration are suggested. Four coefficients are

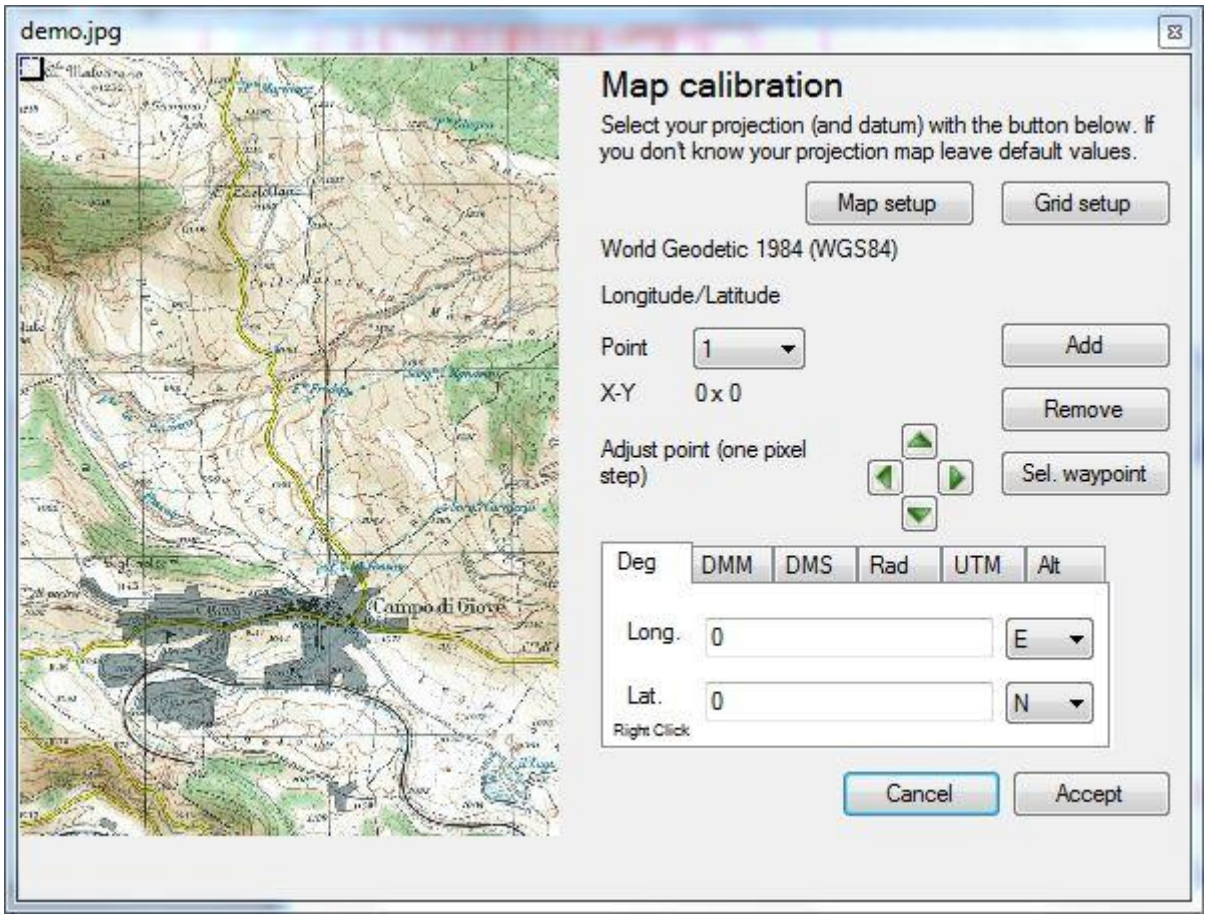
determined to manage the **scale** (scaling or stretching) and the **displacement** (shifting)
- **affine** - when three points of calibration are suggested. Six coefficients are determined to manage the **scale** (scaling or stretching), the **rotation** and the
- **distortion** (rotation or skewing) and **displacement** (shifting)
- **similar with average of the coefficients** - when are suggested more than three points of calibration. The similar method is used by taking three points at a time and finally made the average of the coefficients.

Currently no method is used for higher-order polynomial (non-linear) that would georeference maps deformed in a non-uniform way.

The calibration process in OkMap includes the following steps.

Opening the image file that represents the map to be calibrated using the menu *File - New - Raster map*. A panel, containing the information needed for calibration, is opened on the right side of the main content.

For convenience the panels Mini map and Lens are activated to facilitate the operations of selecting reference points.

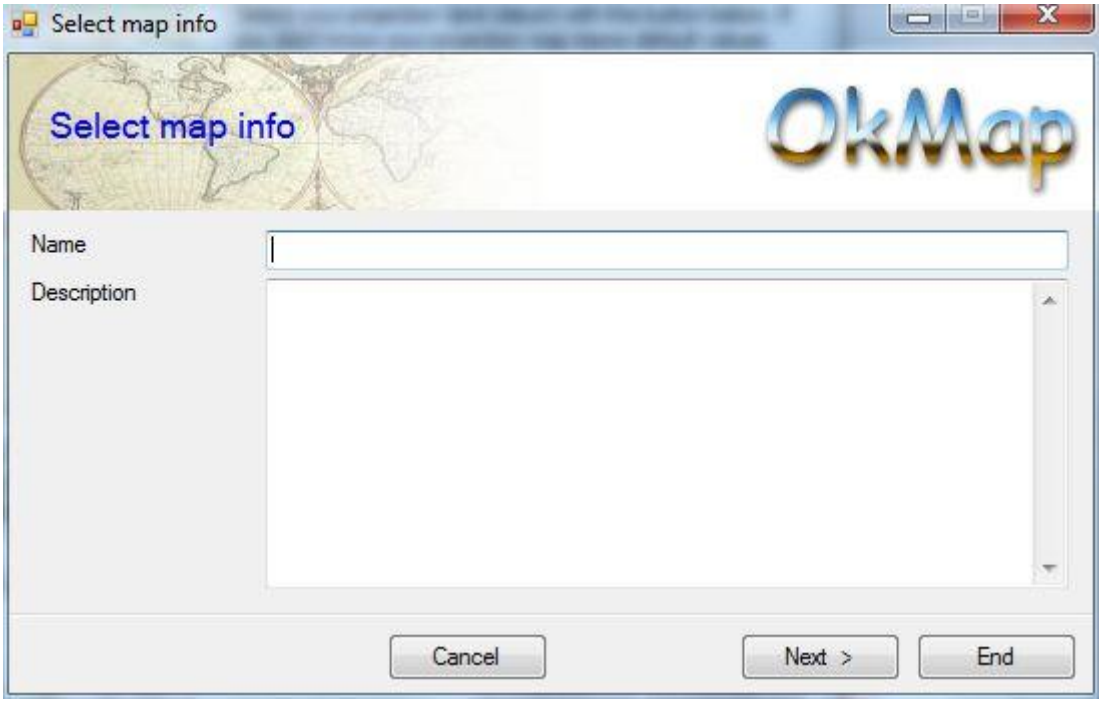



First you press the *Map setup* button. Do not do this means to indicate the WGS84 datum and Longitude / Latitude as projection.

A series of windows (wizard) that allow you to specify the characteristics of the map (name, description, datum, projection and its parameters) are displayed.

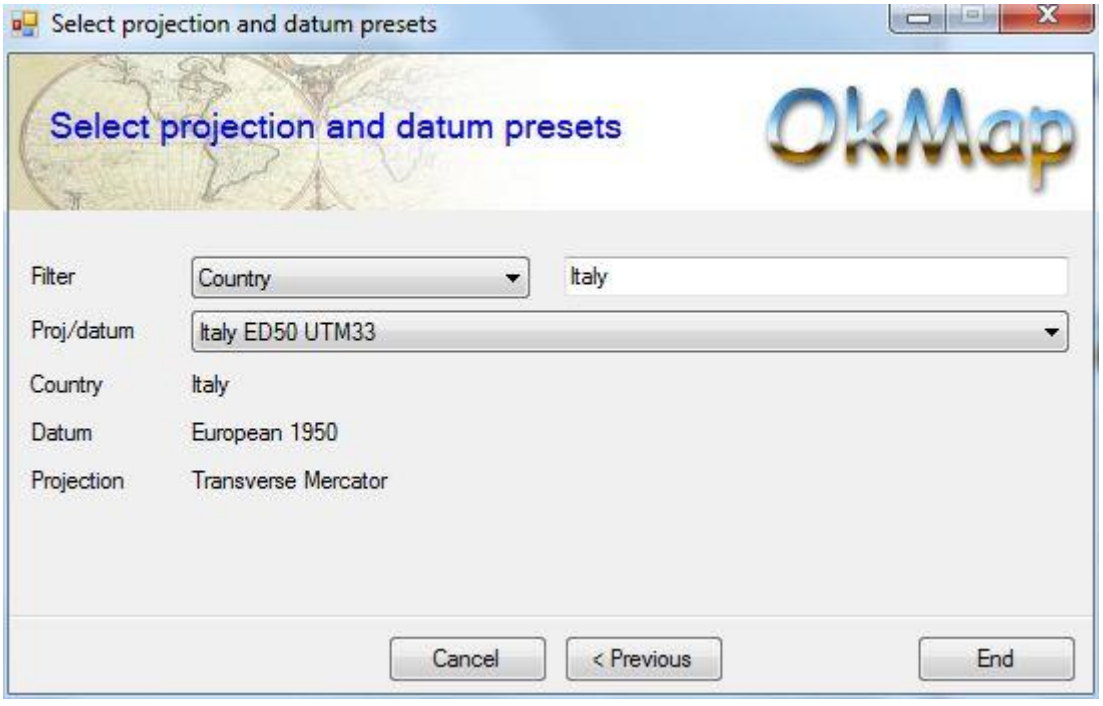
To switch between windows using the *Next* > and< *Previous* buttons. To close the wizard press the *End* button; to cancel it press the *Cancel* button.

The first window is used to indicate the name and description of the map (both optional).




The next window is to indicate with a simple selection: reference datum, projection type and relative parameters.

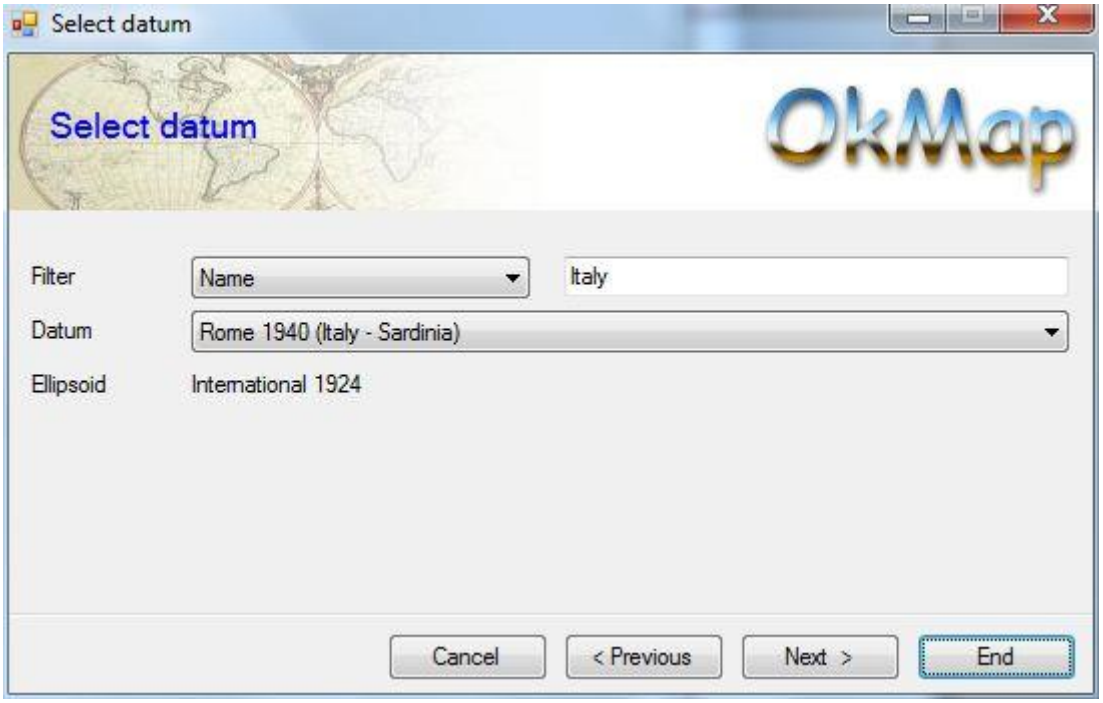
The data are contained in a database that covers a large number of definitions used by most nations in the layout their own maps.




The list shows only the presets of datum / projection active. To enable or disable one or more definitions use the function List-Presets.

After making your selection, the wizard ends. If it was not possible to identify the characteristics of the map that is georeferenced, you can proceed to a manual selection of information leaving the selection blank and press the *Next* > button.

In this case a window for setting the datum used by the map is displayed.

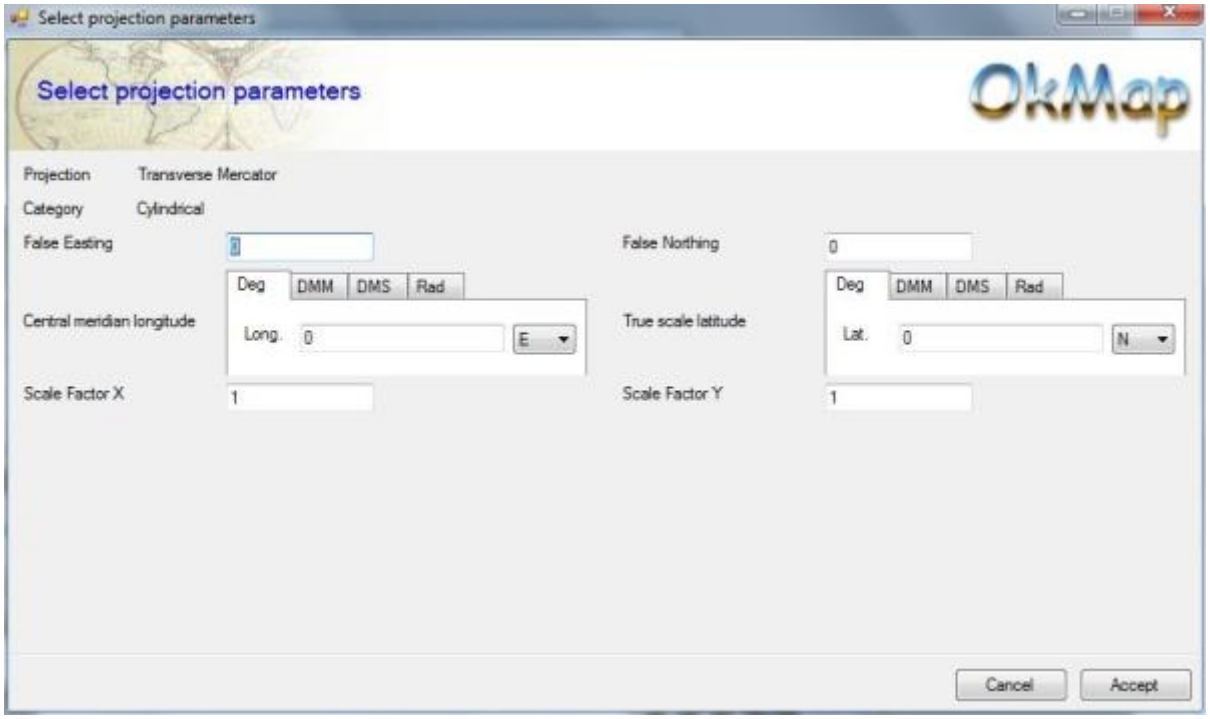



The list shows only the active datum. To enable or disable one or more datum to use the List -Datum function.

Going forward, a window is displayed to define the type of projection used by the map.

If the desired projection does not appear in the list and the area of the map covers a small area, you can get a good approximation by selecting the *Longitude / Latitude* projection.

Once selected the projection, press the *Parameters* button to indicate the parameters of the projection.




The type and the number of the parameters depend on the projection in object. For more information consult the paragraph *Projection parameters* of the page What are the cartographic projections.

Do not make the selection of parameters is equivalent to set the center of the projection on the Greenwich meridian to the equator, the false east and the false north to zero and the scale factor to 1.

The *Accept* button acquires the information about the projection parameters and display the window of choice of the projection again. The *End* button close the wizard related to the setup of the map.

Now you just have to choose the known points on the map and input their coordinates. The known points can be:

- Intersections of meridians and parallels that you known the coordinates (usually maps showing grids show the geographical coordinates at the edges).
- A precise location on the map of which you know the coordinates (waypoint).

Select the menu Tools - New georef. point.

Click the left button of the mouse over the map to the known point. The cross cursor facilitates the task and the lens window can help you to locate the precise point.

When this is done an icon is displayed on the selected point; the point position can be improved using the four directional green arrows which will move it by one pixel in any direction.

The coordinates of the point, expressed in pixels (XY), are displayed under the combo box that indicates the number of the current point.

Once selected the point, you must digit the coordinates in the panel at the bottom right or select a known waypoint by the *Sel. waypoint* button.

If you manually typed the coordinates, you can choose their mode of representation, selecting:

- Degrees - coordinates expressed in decimal degrees
- GMM - coordinates expressed in degrees and decimal minutes

- GMS - coordinates expressed in degrees, minutes and decimal seconds
- UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
- Rad - expressed in decimal radiant

If the *Sel. waypoint* button is pressed, a table containing the list of selectable waypoint is displayed.

For more information about the general use of tables, see the topic Data tables.

To select a waypoint, select a row and press the *Apply* button or simply double-click with the left mouse button in the row to be selected.

To facilitate the search of a waypoint, fill the *Find* field with the leading characters of the column on which the sort order is selected.

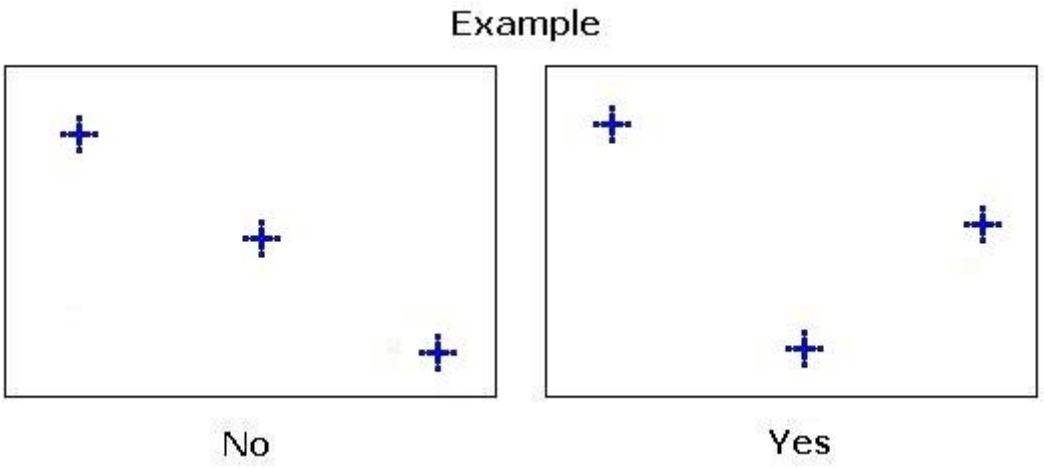
To add a new georeferencing point use the *Add* button. The current point is displayed on the map with an icon surrounded by a rectangle.

The combo box *Point* displays the number of the current point. The current point can be changed and its coordinates (if already typed) will be automatically displayed.

A point and its coordinates can be deleted with the *Remove* button.

To complete the process of georeferencing you must input at least two points (preferably three or more) and then press the *Accept* button.

Avoid choosing positions lined up in the two aces because the georeferencing would result few reliable or in some cases it would be impossible to resolve the system of equations on the basis of the determination of the coefficients of calibration.



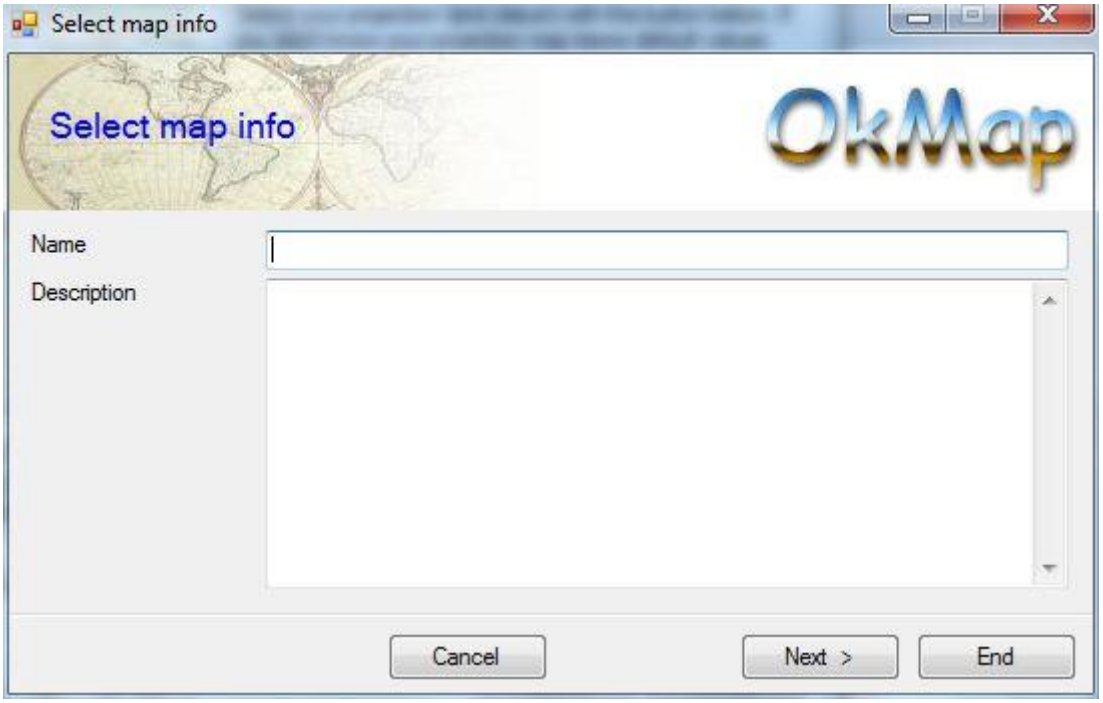

## Create a vectorial map

The procedure for creating a vectorial map in OkMap includes the following steps.

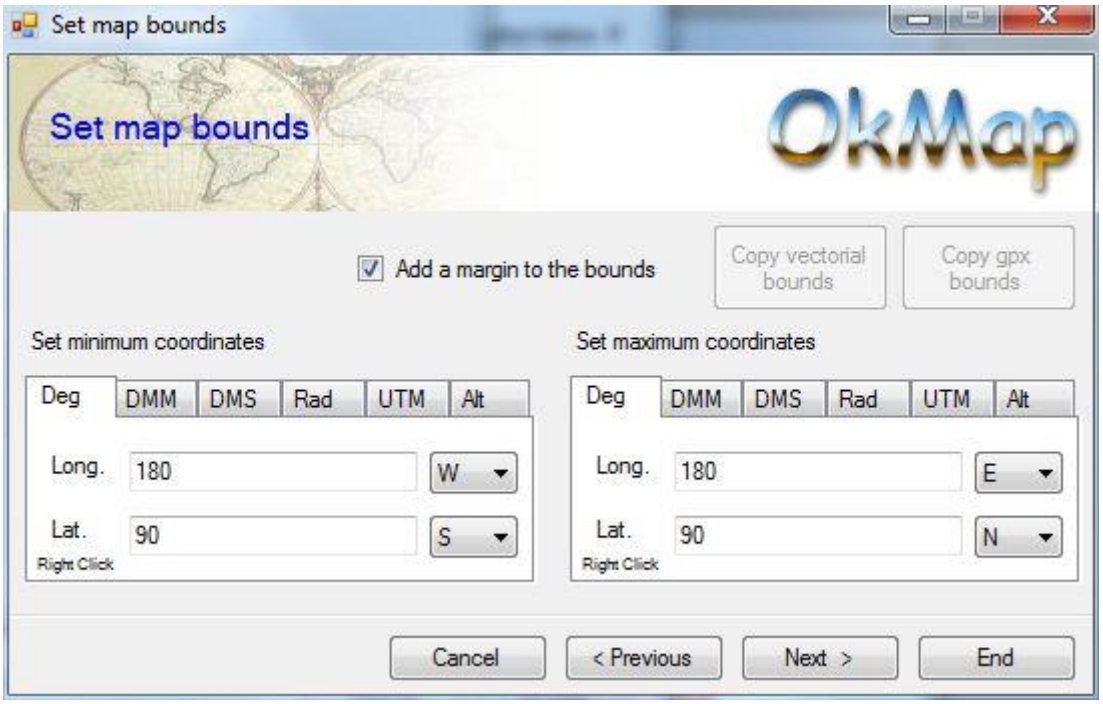
Use the menu *File - New - Vectorial map* to display a series of windows (wizard) to help identify the characteristics of the map (name, description, datum, projection and its parameters).

To switch between windows use the *Next* > and< *Previous* buttons. To close the wizard to press the *End* button; to cancel it press the *Cancel* button.

The first window is used to indicate the name and description of the map (both optional).




The next window is used to indicate the geographical limits of the vectorial map you are creating.

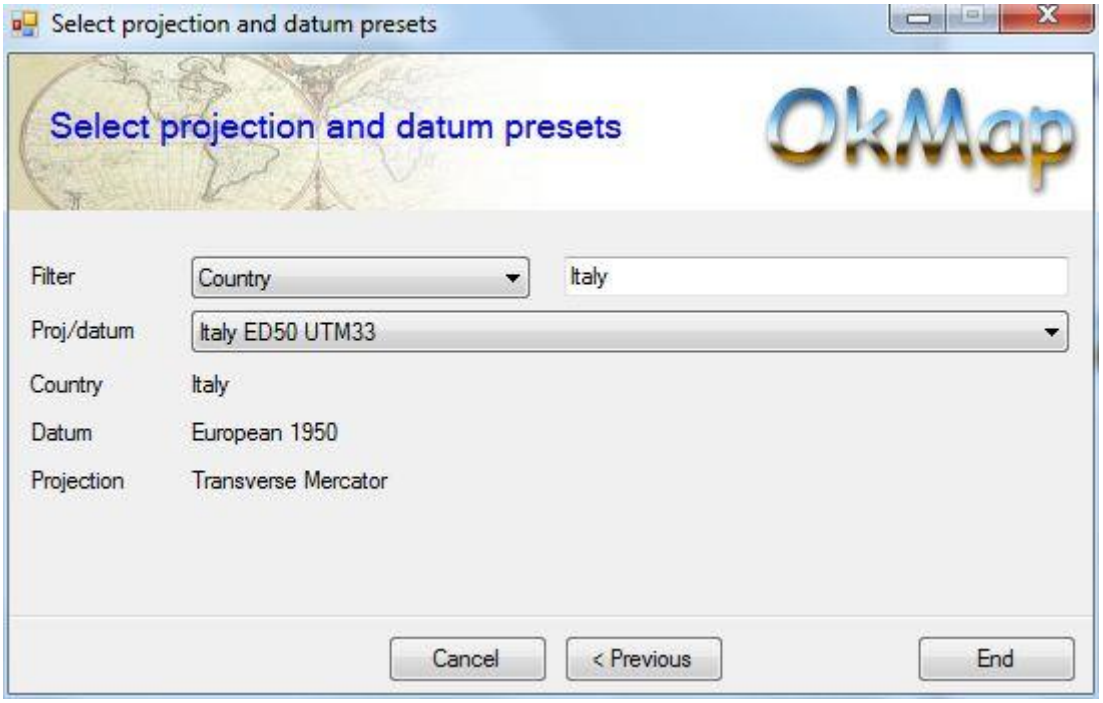



The geographical bounds are expressed in terms of minimum coordinates (geographical position at the top left of your map) and maximum coordinates (geographical position at the bottom right).

Can be chosen mode of representation of the coordinates, selecting:

- Degrees - coordinates expressed in decimal degrees
- GMM - coordinates expressed in degrees and decimal minutes
- GMS - coordinates expressed in degrees, minutes and decimal seconds
- UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
- Rad - expressed in decimal radiant

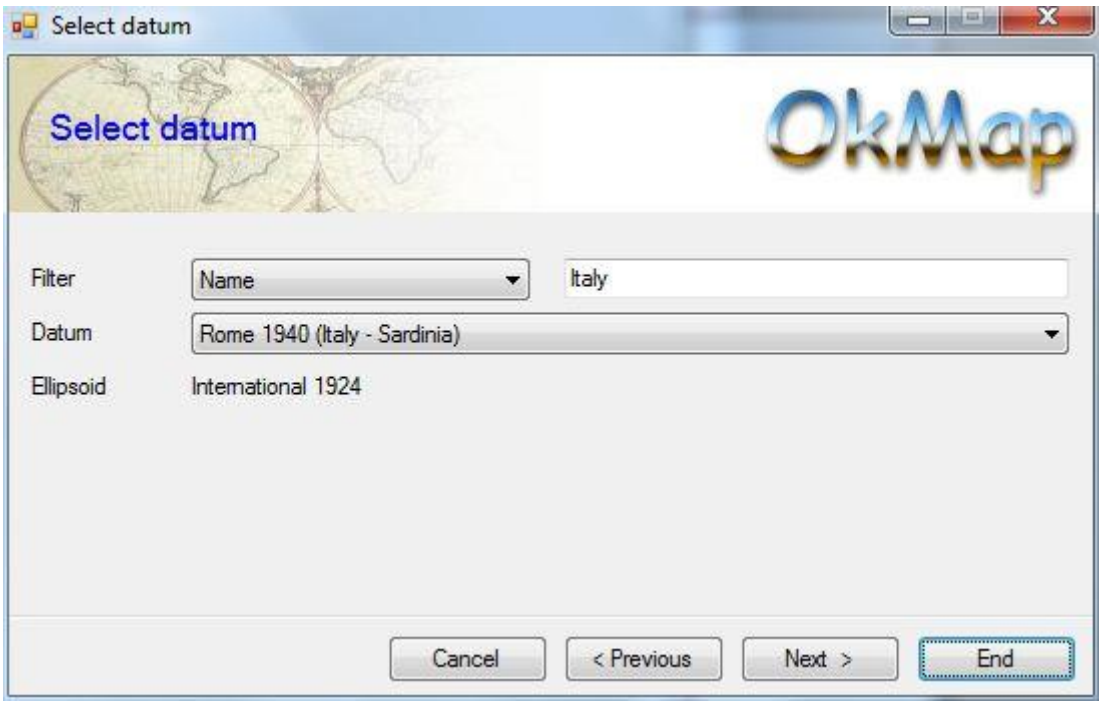
The next window is to indicate with a simple selection: reference datum, projection type and its parameters, using a database that contains a large number of definitions used by most nations in the layout their own maps.




The list shows only the presets of datum / projections active. To enable or disable one or more definitions use the function List-Presets.

Once you select the wizard ends. If it was not possible to identify the characteristics of the map you are creating, you can proceed to a manual selection of information, leaving empty the selection field and pressing the *Next* > button.

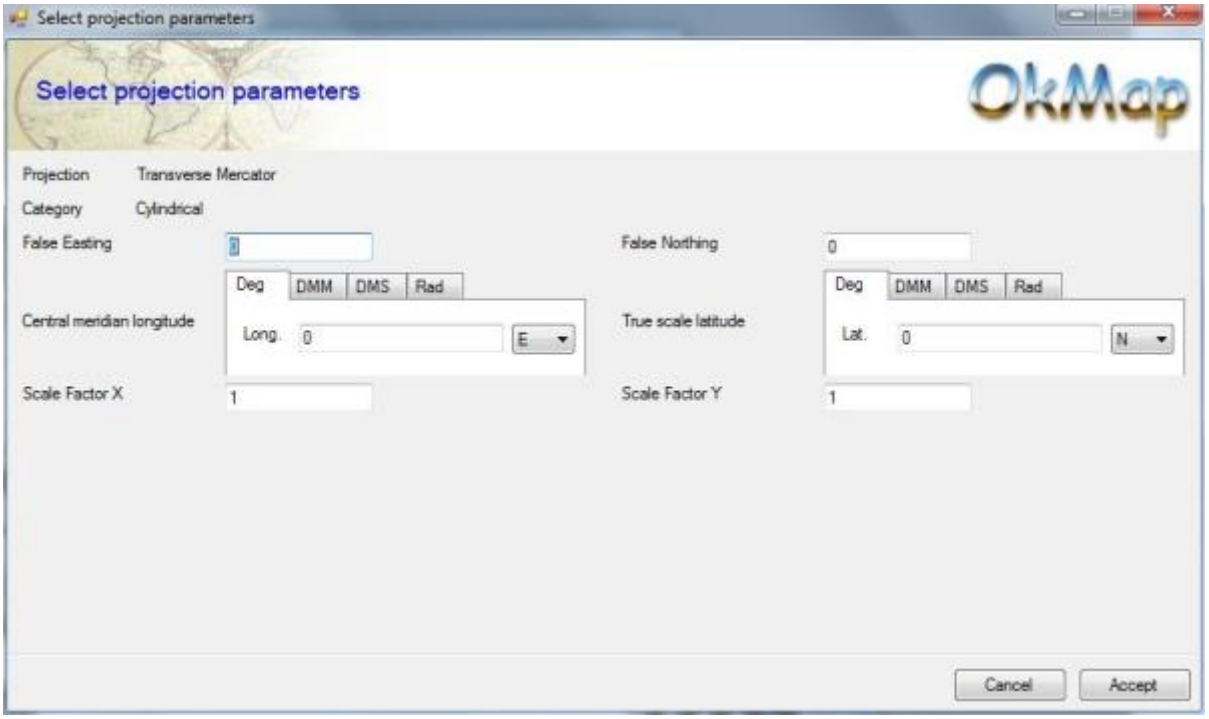
In this case a window is displayed to define the datum used by the map.




The list shows only the presets of datum / projections active. To enable or disable one or more definitions use the function List datum.

Going forward, a window is displayed to define the type of projection used by the map.

Once selected, press the *Parameters* button to indicate the projection parameters.




The type and number of parameters depend on the projection in question. For more information refer to the projection parameters of topic *Projection parameters* of the page What are the cartographic projections.

Do not make the selection of parameters is equivalent to set the center of the projection on the Greenwich meridian to the equator, the false east and north to zero and the scale factor to 1.

The *Accept* button acquire information about the parameters and redisplays the window of choice of the projection. The *End* button ends the wizard related to the creation of the map.

Once finished the procedure, you will see a blank map on which you can design your own vectorial data or import them from external files.

It is also possible to modify the grids properties, as for raster maps, through the menu *File - Modify - Grid parameters*.

## Save a map in OkMap format

Once the calibration procedure of a raster map, the creation of a vectorial map or the variation of the attributes of a map is finished, it is possible to save the new characteristics in a definition file with extension .okm.

To save the map use the menu *File - Save – Map*; then choose to save the file as *OkMap* in the *Save as* combo.

If it is a raster map, the file must reside in the same folder as the image file. Exception to this rule are the maps of image files that are stored in the folder specified in the function Preferences - Maps, in the field *Alternative image map folder*; the files .okm that relate to these images can be saved in any folder.

By default, the last file .okm opened is proposed.

The above is particularly useful if the map images are stored on a DVD (you cannot store their files .okm on a DVD); in such case specify in the function Preferences - Maps, in the field *Alternative image map folder* the device DVD player (example: D:\).

In the file .okm will save all the characteristics of the map:

- Name and description of the map
- Geographical bounds of the map
- Image file name (only in case of map raster)
- Dimensions in pixel of the file image (only in case of map raster) Reference datum
- Used projection and its parameters
- Characteristics of the grids
- Calibration points and their coordinates (in the case of raster map) Direct and inverse coefficients of calibration (only in case of map raster)
- Vectorial data (also a map raster can contain vectorial data)

## Save a map in World file format

To save the map use the menu *File - Save – Map*; then choose to save the file as *World file* in the *Save as* combo.

The image file of the map must have the extension: .jpg, .tif, .gif, .bmp, .png.
The file extension is assigned according to the following matches:

| World file | File image |
|---|---|
| .gfw | .gif |
| .jgw | .jpg |
| .pgw | .png |
| .tfw | .tif |
| .bpw | .bmp |

A window allows to input the type of the coordinates contained in the GeoTiff file.

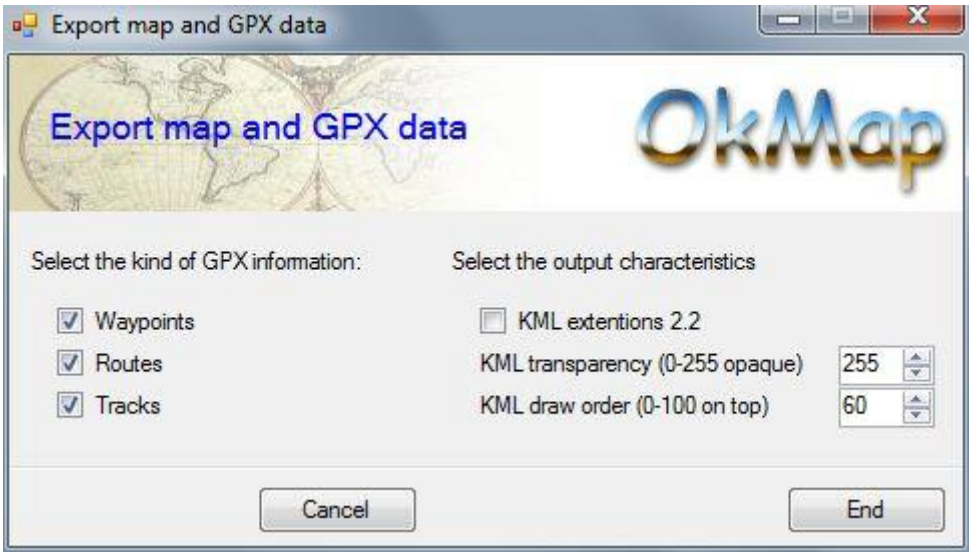
In this window you must specify the unit of measurement of the coordinates.

## Save a map in Google Earth KML/KMZ format

To save the map use the menu *File - Save – Map*; then choose to save the file as *Google Earth KML or KMZ* in the *Save as* combo.

The resulting file will eventually contain the loaded GPX data.

The following window is displayed.




In this window you can specify which types of GPX data you want to include in the output file:

- Waypoints
- Routes
- Tracks

the KML specifics:

- The use of extensions kml 2.2
- The KML transparency (0=Transparent, 255=Opaque)
- The KML draw order (0=Invisible, 1-49=Under the vectorial data, 50-100=On the top)

The *End* button acquires the information and process the data. The *Cancel* stops the process.

## Save a map in OziExplorer format

To save the map use the menu *File - Save – Map;* then choose to save the file as *OziExplorer* in the *Save as* combo.

The image file of the map must have the extension: .bmp, .tif, .jpg, .png, .cap, .ecw, .jp2.

If OkMap is unable to determine the corresponding OziExplorer datum, a window is displayed for manual acquisition.

## Save a map in GPSTuner format

To save the map use the menu *File - Save – Map;* then choose to save the file as *GpsTuner* in the *Save as* combo.

The image file of the map must have the extension: .jpg, .gif, .bmp, .png.

## Load a map in OkMap format

To load a map (raster or vectorial) use the menu *File - Load - Map*; then choose to load the file as *OkMap* in the *File type* combo.

If it is a raster map, OkMap open the corresponding image file declared in the map file; such file must reside in the same folder as the .okm file, or in the folder specified in the function Preferences-Maps, in the field *Alternative image map folder*.

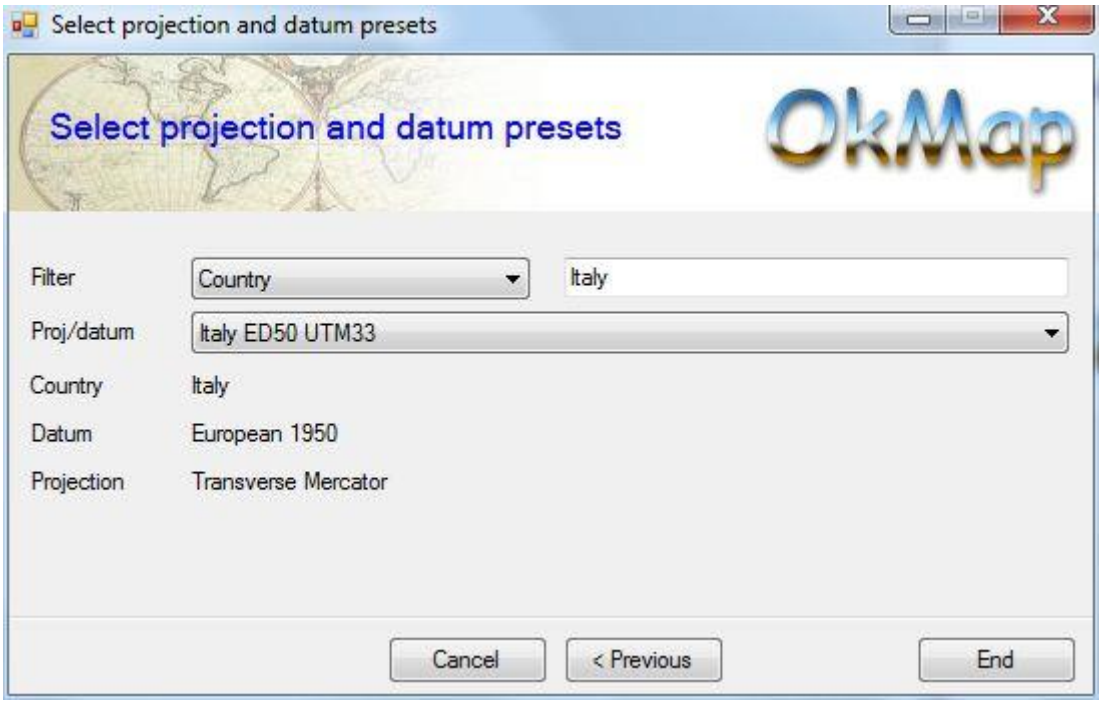
The map is displayed with a zoom / scale set so as to be entirely displayed in the window or with the zoom / scale used the last time the map was open (if this is specified in the function Preferences-Maps, in the field *Set last zoom/pan after map loading*).

## Load a map in ECW format

To load a map use the menu *File - Load - Map*; then choose to load the file as *ECW image* in the *File type* combo.

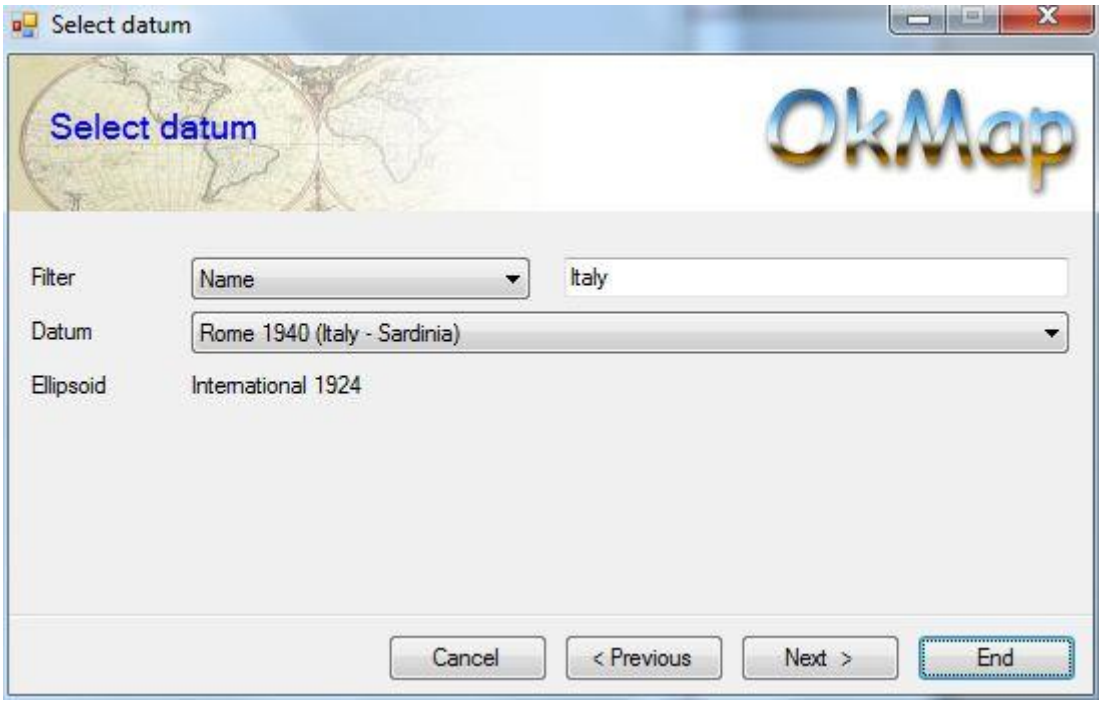
If during the examination of the ECW file OkMap is unable to determine the projection used, a window is displayed to acquire, with a simple selection: reference datum, projection type and its parameters.

The data are stored in a database that contains a big number of definitions used by many nations in drafting their own maps.




The list shows only the datum / projections presets active. To enable or disable one or more definitions use the function List - Presets.

Similarly, if OkMap is unable to determine the datum used in the map, a window is displayed for manual acquisition.




The list shows only the active datum. To enable or disable one or more datum to use the function List - Datum.

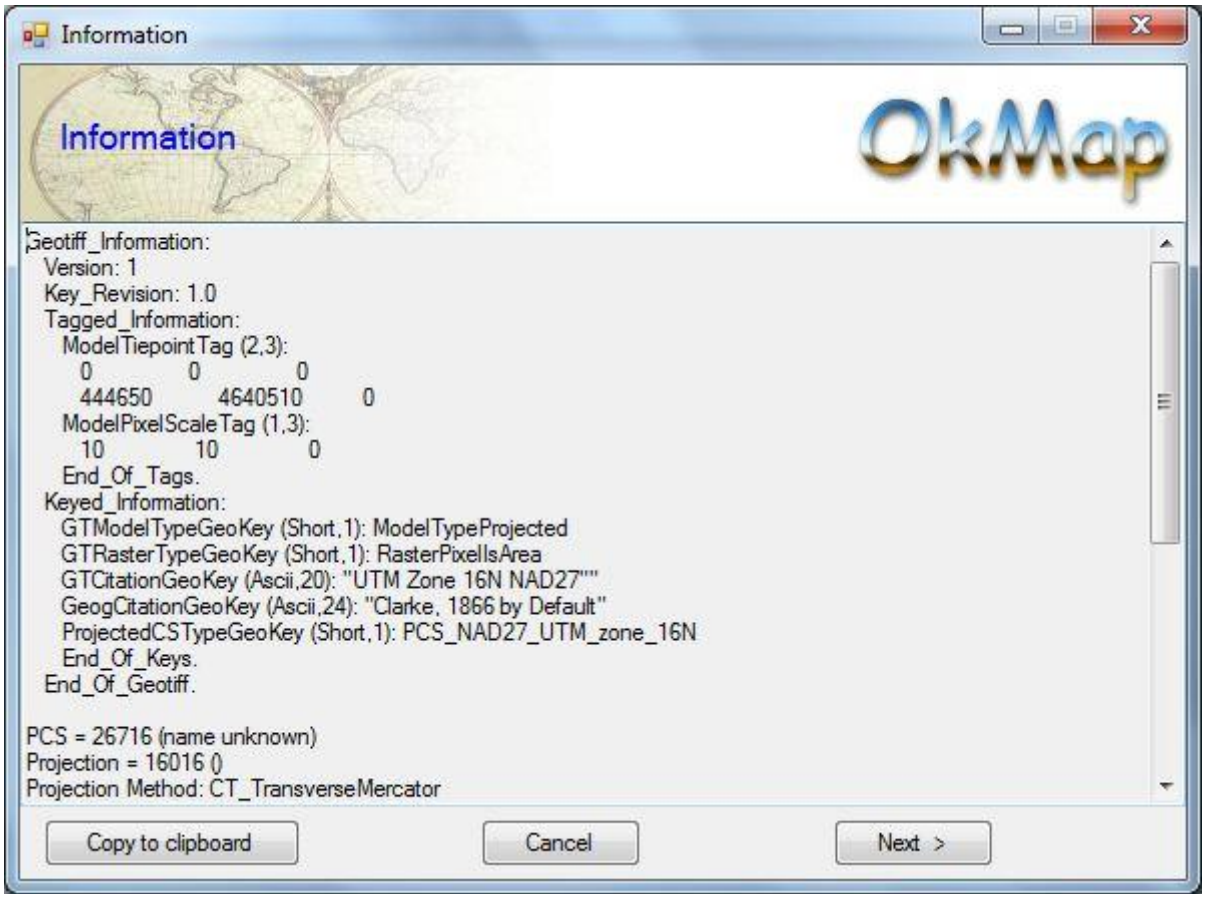
## Load a map in Geotiff format

To load a map use the menu *File - Load - Map*; then choose to load the file as *GeoTiff* in the *File type* combo.

After the file selection, a series of windows (wizard) is displayed to identify the characteristics of the coordinates and of the map (type of coordinates, datum, projection and its parameters).

To switch between windows use the keys *Next* > and < *Previous* buttons. To close the wizard press the *End* button. To cancel it press the *Cancel* button.

The first window show all the tags contained in the TIF file in a readable form.




The second window allows to input the type of the coordinates contained in the GeoTiff file.

In this window you must specify the unit of measurement of the coordinates.

The next window is to indicate with a simple selection: reference datum, projection type and parameters.

The data are stored in a database that contains a big number of definitions used by many nations in drafting their own maps.

The list shows only the datum / projections presets active. To enable or disable one or more definitions use the function List - Presets.

Once you select the wizard ends. If unable to identify the characteristics of the map is georeferenced, you can proceed to a manual selection of information, leaving empty the selection field and pressing the *Next* > button.

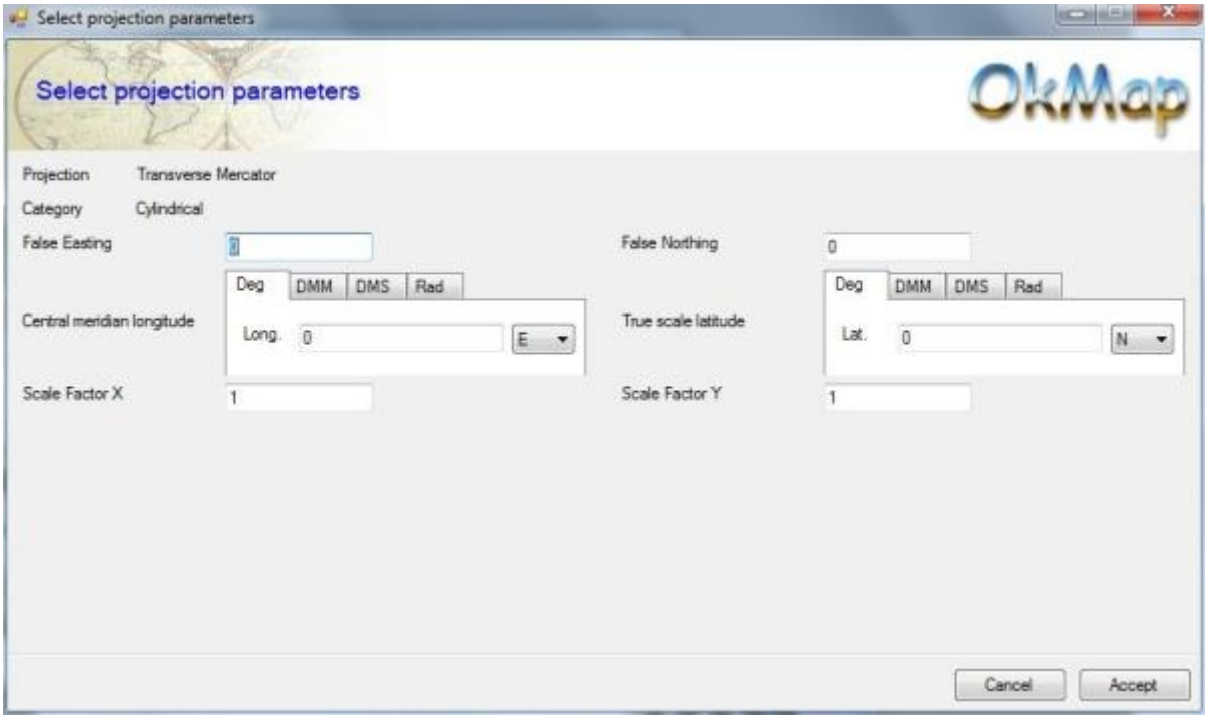
In this case a window is displayed for the definition of the datum used by the map.

The list shows only the datum active. To enable or disable one or more definitions use the function List - Datum.

Going forward, a window is displayed to define the type of projection used by the map.

If the desired projection did not appear in the list and the surface of the map covers a small region, one can obtain a good approximation by selecting the projection *Longitude / Latitude*.

Once selected the projection, press the button *Parameters* to indicate the projection parameters.




The type and number of parameters depend on the projection in question. For more information refer to the *Projection parameters* of the page [What is a cartographic projection](#).

Do not make the selection of parameters is equivalent to set the center of the projection on the Greenwich meridian to the equator, the false east and north to zero and the scale factor to 1.

The *Accept* button acquire information about the parameters and redisplays the window of choice of the projection. The *End* button ends the setup wizard of the map.

## Load a map in World file format

To load a map use the menu *File* - *Load* - *Map*; then choose to load the file as *World file* in the *File type* combo.

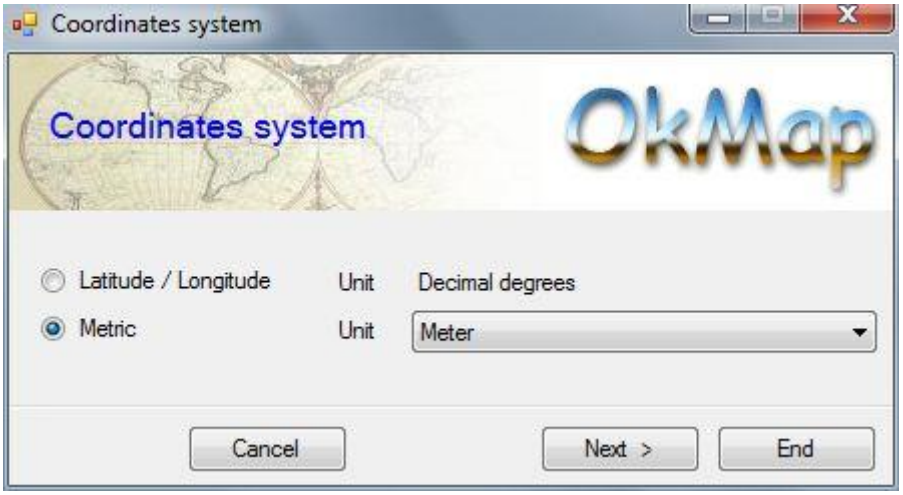
World file and image file must have the same name but different extension, according to the following matches:

| World file | File image |
|---|---|
| .gfw | .gif |
| .jgw | .jpg |
| .pgw | .png |
| .tfw | .tif |
| .bpw | .bmp |

After the file selection, a series of windows (wizard) is displayed to identify the characteristics of the coordinates and of the map (type of coordinates, datum, projection and its parameters).

To switch between windows use the keys *Next* > and < *Previous* buttons. To close the wizard press the *End* button. To cancel it press the *Cancel* button.

The first window allows the input of the type of coordinates contained in the World file.




In this window you must specify whether the coordinates contained in World file are geographical or metric; in which case you must also specify the unit of measurement.

The next window is to indicate with a simple selection: reference datum, projection type and parameters.

The data are stored in a database that contains a big number of definitions used by many nations in drafting their own maps.

The list shows only the datum / projections presets active. To enable or disable one or more definitions use the function List - Presets.

Once you select the wizard ends. If unable to identify the characteristics of the map is georeferenced, you can proceed to a manual selection of information, leaving empty the selection field and pressing the *Next* > button.

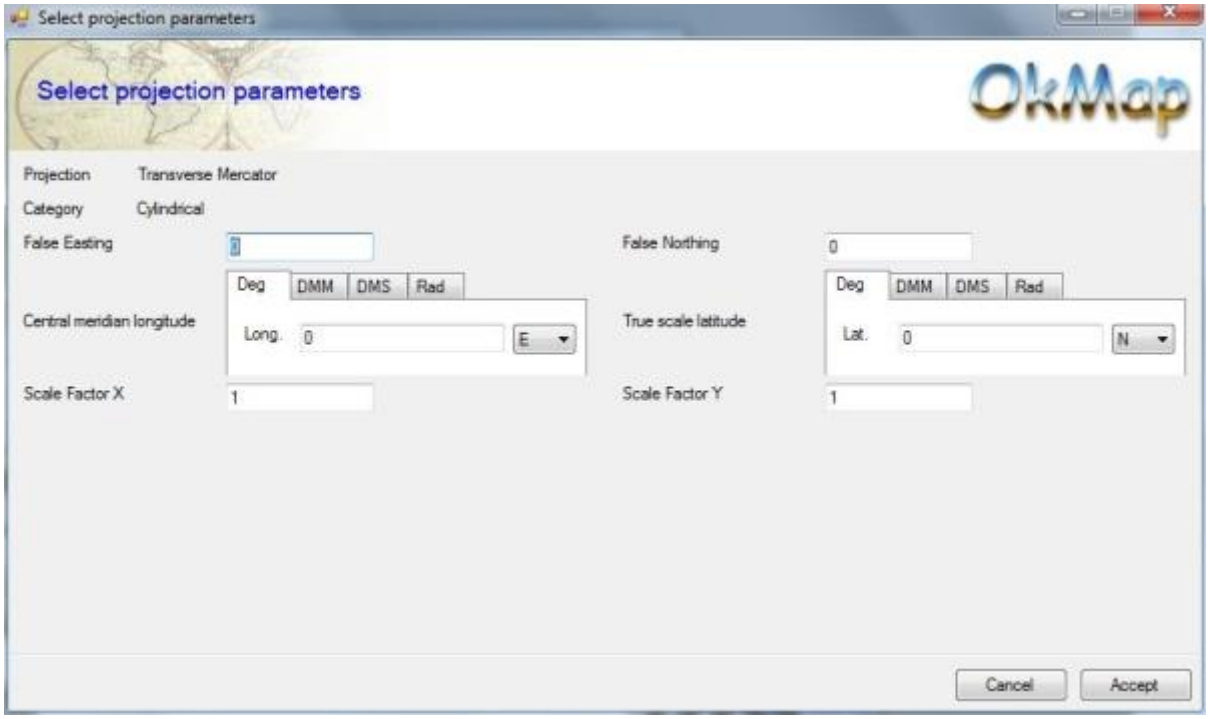
In this case a window is displayed for the definition of the datum used by the map.

The list shows only the datum active. To enable or disable one or more definitions use the function List - Datum.

Going forward, a window is displayed to define the type of projection used by the map.

If the desired projection did not appear in the list and the surface of the map covers a small region, one can obtain a good approximation by selecting the projection *Longitude / Latitude*.

Once selected the projection, press the button *Parameters* to indicate the projection parameters.




The type and number of parameters depend on the projection in question. For more information refer to the *Projection parameters* of the page What is a cartographic projection.

Do not make the selection of parameters is equivalent to set the center of the projection on the Greenwich meridian to the equator, the false east and north to zero and the scale factor to 1.

The *Accept* button acquire information about the parameters and redisplays the window of choice of the projection. The *End* button ends the setup wizard of the map.

## Load a map in OziExplorer format

To load a map use the menu *File - Load - Map*; then choose to load the file as *OziExplorer* in the *File type* combo.

If OkMap is unable to determine the datum used in the map, a window is displayed for manual acquisition.

The list shows only the datum active. To enable or disable one or more definitions use the function List - Datum.

## Load a map in GPSTuner format

To load a map use the menu *File* - *Load* - *Map*; then choose to load the file as *GpsTuner* in the *File type* combo.

## Modify scale / zoom

The image of a raster map can be enlarged or scaled by adjusting the zoom factor. The zoom factor of 100% indicates that the image is displayed full size. Increasing the zoom factor, the image is enlarged, vice versa is scaled.

Similarly, for a vectorial map is defined the scale that indicates how many meters are represented in a pixel. Decreasing the number of meters represented in a pixel will result in a magnification of the image and vice versa.

To adjust the zoom level (raster map) or scale (vectorial map) you can use the mouse wheel forward or backward.

Alternatively you can use the menus *Zoom* - *Zoom +* / *Zoom* - for the raster maps and the menus *Scale* - *Scale +* / *Scale* - for the vectorial maps; In such case you will get an increase / decrease the zoom / scale of 20%.

Using the menu *Zoom* / *Scale* - *Fit on page* you get a zoom level / scale such that the map will be shown entirely in space made available by the window.
In the *Zoom* menu are also available predefined levels (e.g.: 50%, 100%, 120%, etc.). Similarly in the menu *Scale* are also available predefined levels (e.g.: 100 mt / pixel, 1 km / pixel, etc.).

You can also use the left mouse button while holding down the *Alt* key to draw a rectangle on which zoom into the map.

## Move the map

If the zoom factor or scale was such that the displayed image is only a portion of the entire map, you can shift the image in 4 directions, using one of the following methods:

- Press the left mouse button and drag.
- Use the 4 arrow keys.
- Place your mouse over the map edges or corners and press the left mouse button.
- Double click the left mouse button on the map; this function moves that point to the central position of the map.

## Modify the calibration of a raster map

Change the calibration of a raster map may be needed when you notice that the georeferencing procedure does not produce good results.

This usually when you realize:

- It displays a grid and you see that this does not coincide with that drawn on the map.
- Positioning the mouse over an intersection of the grid, the coordinates displayed in the status bar do not match the real ones shown on the edge of the map.
- Positioning the mouse over a known point, the coordinates displayed in the status bar does not coincide with those known.

This procedure can also modify some features of the map as the name and the description.

To change the calibration of a raster map (after you have loaded it) use the menu *File - Modify - Map parameters*.

The procedure of calibration is quite identical to that described in the page Calibrate a raster map.

## Modify a vectorial map

Modify a vectorial map can be useful for:

- Change the name and / or description of the map
- Change the geographical bounds of the map Change the datum
- Change the projection and / or the its parameters

To change the characteristics of a vectorial map (after you have loaded it) use the menu *File - Modify - Map parameters*.

The procedure of change is quite identical to that described in the page Create a vectorial map.

The only difference is that two buttons may be active in the window on the setting of bounds of the map:

- *Copy the bounds of vectorial data* (if you introduce vectorial data)
- Copy the bounds of the GPX data (if data GPX is loaded)

The first button automatically compiles the geographical bounds of the map using the geographical bounds of vectorial data, thus limiting or extending the area covered by the vectorial map.

Similarly, the second button performs the same operation but using the bounds of the loaded data GPX.

## Index the maps

Index maps to OkMap means to build an internal database with a list of all maps available on your drives, each with its own characteristics.

Once built this database you can list the available maps or display the bounds of the maps on a general map.

To build the list of available maps you make the following steps:

- Using the function Preferences - Maps indicate, in the fields Map folder 1/4, the folder where your maps reside (you can specify up to four different directories).
- If necessary use the ... buttons to open a dialog box to select the folder.
- Possibly click the fields *Include subfolder* to indicate whether OkMap will find maps in the subfolders.
- Confirm your changes with *Ok* button.

The map indexing is done automatically when editing the map folders. A window will display the files in sequence analysis.

If you wish to force re-index because you have changed the contents of folders you can use the maps menu *Maps - Reindex maps*.

## List the available maps

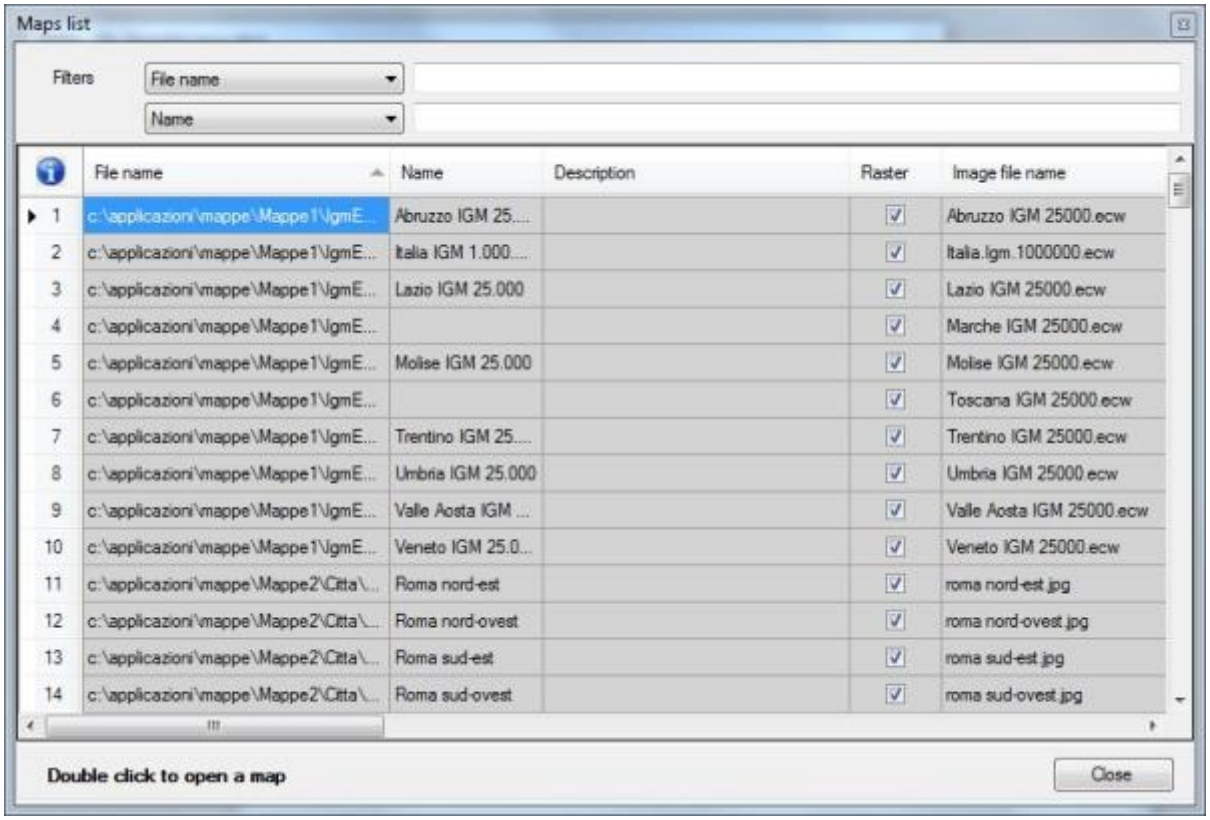
List the available maps lets you see all of the maps in our possession and let you choose to open a map based on the needs of the moment.

To view a list of our maps, you must:

- Have specified in the function Preferences - Maps in which folders are stored the maps.
- Have made the indexing procedure.

To view the list of maps in the database use the menu *Maps - List maps*. A table containing the following information is displayed:

- File name
- Map name and description Reference datum Projection used
- Indicator if map is raster (or vectorial) Map size in pixel (raster)
- Area covered by the map
- Geographical bounds of the map


Maps list
Filters
File name
Name
File name
Name
Description
Raster
Image file name
1 c:\applicazioni\mappe\Mappe1\IgmE... Abruzzo IGM 25.... Abruzzo IGM 25000.ecw
2 c:\applicazioni\mappe\Mappe1\IgmE... Italia IGM 1.000.... Italia.Igm.1000000.ecw
3 c:\applicazioni\mappe\Mappe1\IgmE... Lazio IGM 25.000 Lazio IGM 25000.ecw
4 c:\applicazioni\mappe\Mappe1\IgmE... Marche IGM 25000.ecw
5 c:\applicazioni\mappe\Mappe1\IgmE... Molise IGM 25.000 Molise IGM 25000.ecw
6 c:\applicazioni\mappe\Mappe1\IgmE... Toscana IGM 25000.ecw
7 c:\applicazioni\mappe\Mappe1\IgmE... Trentino IGM 25.... Trentino IGM 25000.ecw
8 c:\applicazioni\mappe\Mappe1\IgmE... Umbria IGM 25.000 Umbria IGM 25000.ecw
9 c:\applicazioni\mappe\Mappe1\IgmE... Valle Aosta IGM ... Valle Aosta IGM 25000.ecw
10 c:\applicazioni\mappe\Mappe1\IgmE... Veneto IGM 25.0... Veneto IGM 25000.ecw
11 c:\applicazioni\mappe\Mappe2\Citta\... Roma nord-est roma nord-est.jpg
12 c:\applicazioni\mappe\Mappe2\Citta\... Roma nord-ovest roma nord-ovest.jpg
13 c:\applicazioni\mappe\Mappe2\Citta\... Roma sud-est roma sud-est.jpg
14 c:\applicazioni\mappe\Mappe2\Citta\... Roma sud-ovest roma sud-ovest.jpg
Double click to open a map
Close

Double-clicking with the left mouse button on a row you get the opening of a new map window and loading the map indicated.

For more information about the general use of tables, see the topic Data tables.

Alternatively you can use the menu *Maps - List maps by position*. This function before displaying the list of maps, interposes a window where you can specify a location to narrow the list of those maps that contain the geographic location indicated.

You can enter the coordinates in the box, or:

- choose a location (geocoding) with the *Sel. location* button;
- choose a waypoint with the *Sel. waypoint* button;
- choose a toponym with the *Sel. toponym* button;
- save the shown coordinates as waypoint with the *Save waypoint* button.

If you manually digit coordinates you can choose their mode of representation, selecting:

- Degrees - coordinates expressed in decimal degrees
- GMM - coordinates expressed in degrees and decimal minutes
- GMS - coordinates expressed in degrees, minutes and decimal seconds
- UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
- Rad - expressed in decimal radiant

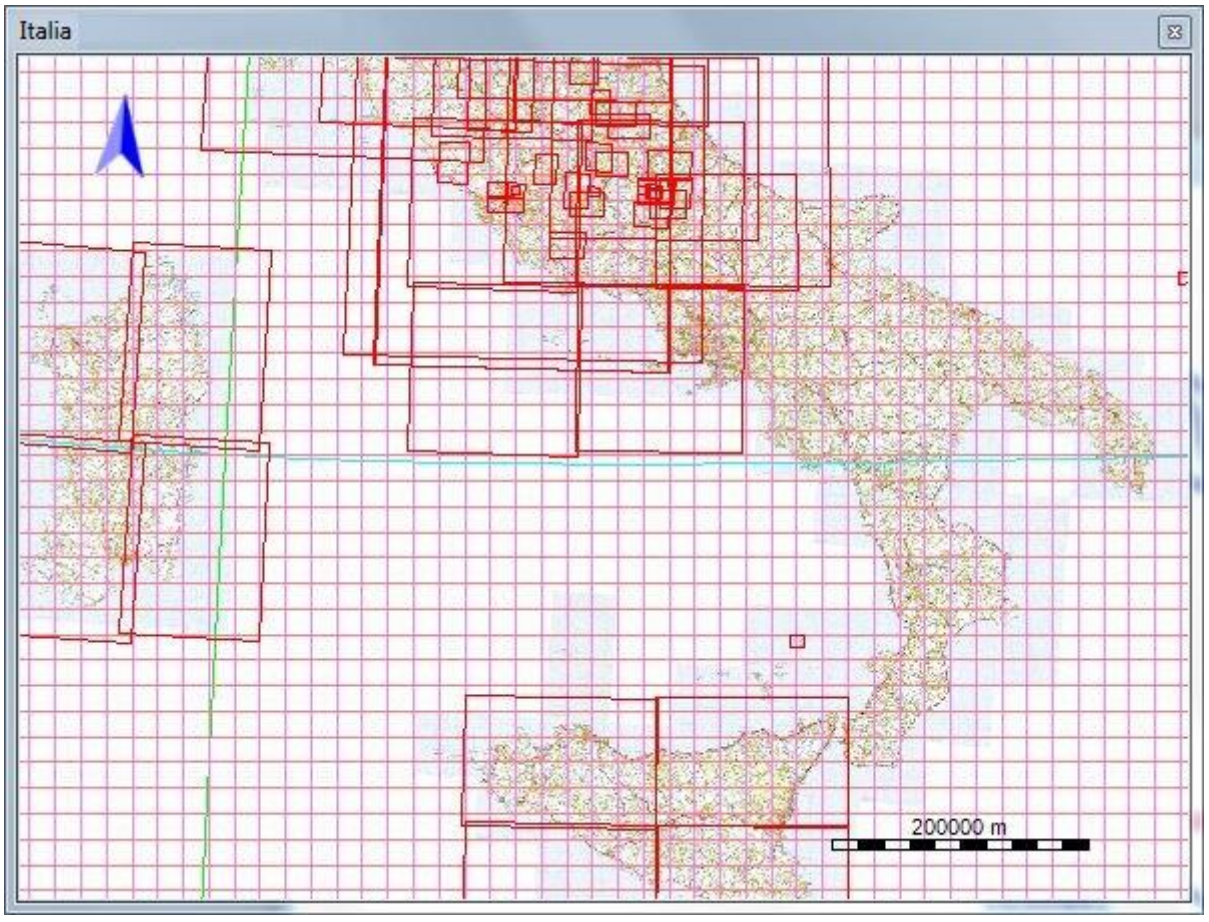
If the *Sel. waypoint* button is pressed, it's displayed a table containing the list of selectable waypoint.

To select a waypoint, select a row and press the *Accept* button or simply double click the left mouse button in the row to select.

Then you can see the list of maps that contain inside the indicated coordinates.

## Visualize the bounds of the maps

It allows to display on a general map (of great extension of the maps of which we want to display the bounds) some rectangles that represent the limits of your maps previously indexed.




It is possible to display some characteristics and eventually to open one of these maps based on the needs of the moment.

To display the bounds of the your maps you must:

- Have specified in the function Preferences - Maps in which folders are stored the maps.
- Have made the indexing procedure.
- Open a greater extension map that can contain maps of where you want to see the bounds.

To display the map bounds in the database use the menu *Maps - View maps bounds*. You can display / hide the names of the maps using the menu *Maps - View maps labels*.

If the function autoinfo (menu *View - Auto info*) is activated, by hovering the mouse on the edges of the maps, you can see a box containing the name, the description and the map file.

In every case, to display information on the map, you can use the right mouse button, click on the limits of a map and select the context menu *Info - map*. This window will close automatically by clicking on another point on the map.

To open a map use the context menu *Open - map*.

## Save the map image to file

Create a copy of the map with all the vectorial data and GPX present.

To obtain a copy of the map image use the menu *File - Save - Map image* or the menu *File - Save - Map screenshot*.

The first saves the entire image of the map at the zoom level while the second only the visible portion of the map.

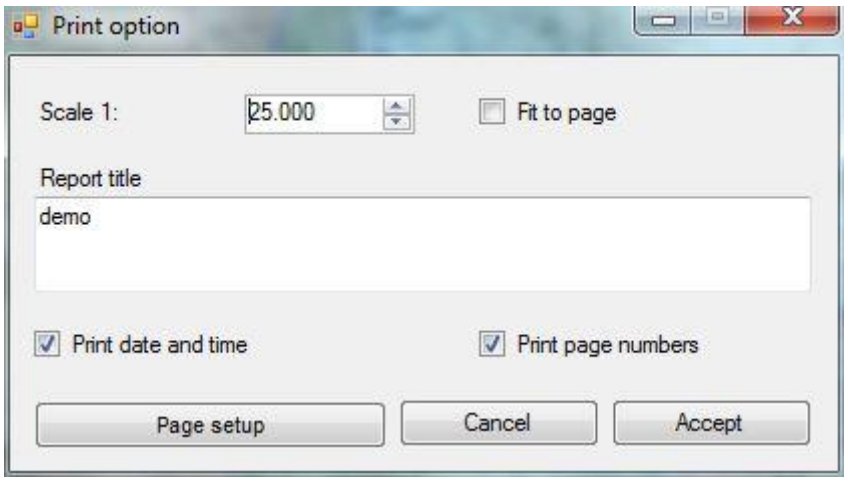
A dialog box for saving the image file is displayed.

The supported formats are: tif, jpg, png, gif, bmp, wmf, emf.

## Print the map image

Need to get a print of the map image as appears on the screen with all its limitations and vectorial data and GPX present.

To print the map image use the menu *File - Print*. A dialog box for choosing the print options is displayed.




## Copy the map image to the clipboard

Need to get a copy to the clipboard of the map image as appears on the screen with all its limitations and vectorial data and GPX present.

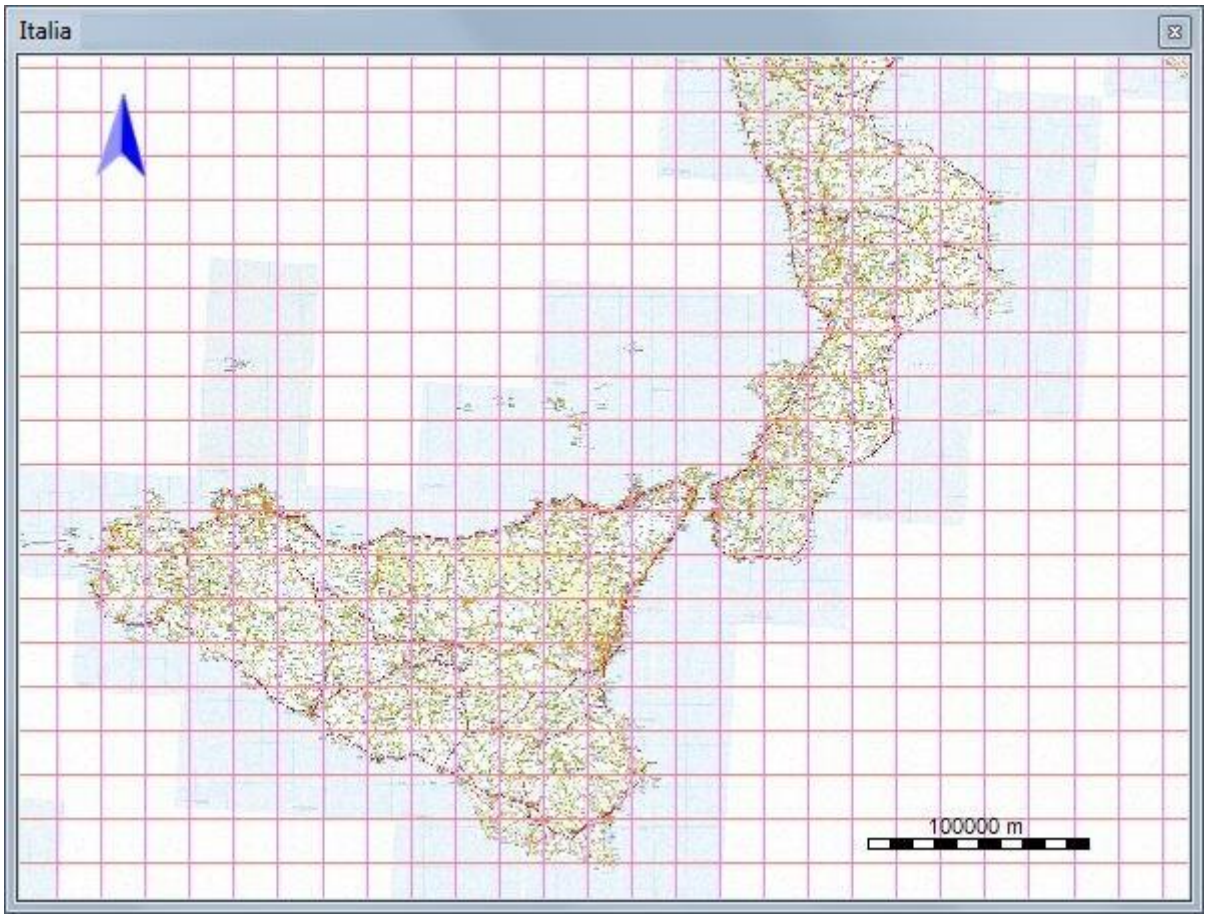
The image can then be pasted on a document such office to create the documentation.

To get a copy in the clipboard of the map image use the menu *File* - *Copy to clipboard*.

# Grids

## What are the grids

The grids are a series of parallel lines to the meridians and the terrestrial parallels to the same way of those drawn on the geographical maps (grid lat / lon).




You can also display a metric grid where the lines are equidistant from each other (UTM grid).

The grids can be drawn both on raster maps and on vectorial maps.

Display the grids let you to quickly verify if a map raster has correctly been calibrated, because the lines drawn by OkMap will trace with precision those drawn on the map.

Some maps show the geographical grid while the other the metric one.

To show or hide the grids use the menu *View - Grid Lat/Lon* or the menu *View - Grid UTM*.

The grids will be drawn only if you have been correctly input the properties of the grids using the menu *File - Modify - Grid map parameters*.

If the suitable parameters set produce a grid too dense, the design of $the grid is turned off, thus avoiding performance degradation. To reactivate the display of the grid, you must first change its properties.

## Grid properties

The properties of the grids allow you to tell to OkMap as to draw on a map the geographical grids (Lat / Lon) and the alternative metric grids.

Properties of the geographical grids are:

- Longitude grid interval (expressed in degrees or fractions)
- Latitude grid interval (expressed in degrees or fractions)

Properties of the metric grids are:

- Longitude grid interval (expressed in kilometers or meters)
- Latitude grid interval (expressed in kilometers or meters)
- Projection and its parameters

These properties can be indicated using the menu *File - Modify - Grid map parameters*. The following window is displayed:

The required information are described in the page grid properties.

# DEM data

## What area the data DEM

The acronym DEM stands for Digital Elevation Model that is a digital representation of the Earth's surface.

There are several formats of DEM data, in particular OkMap uses the following formats:

- SRTM-3 with a resolution of 3 seconds of arc (approximately 90 meters)
- SRTM-1 with a resolution of 1 seconds of arc (approximately 30 meters)

The acronym stands for SRTM Shuttle Radar Topography Mission. This project was developed by NASA (National Aeronautics and Space Administration) and NGA (National Geospatial-Intelligence Agency).

OkMap uses, for instance, the data DEM for:

- Knowing the altitude above sea level of each point on the map
- Assign to each GPX point (waypoints, points of tracks) the relative altitude
- Calculate the minimum and the maximum altitude and the uphill and the downhill of a track
- Build the graph of altitude of a track

Both SRTM-1 and SRTM-3 is available free at http://dds.cr.usgs.gov/srtm/version2_1.

The files have extension .hgt and they have the following format:

- Hemisphere (1 character N/S)
- Latitude (2 numeric characters)
- East / West (1 character E/W)
- Longitude (3 numeric characters)

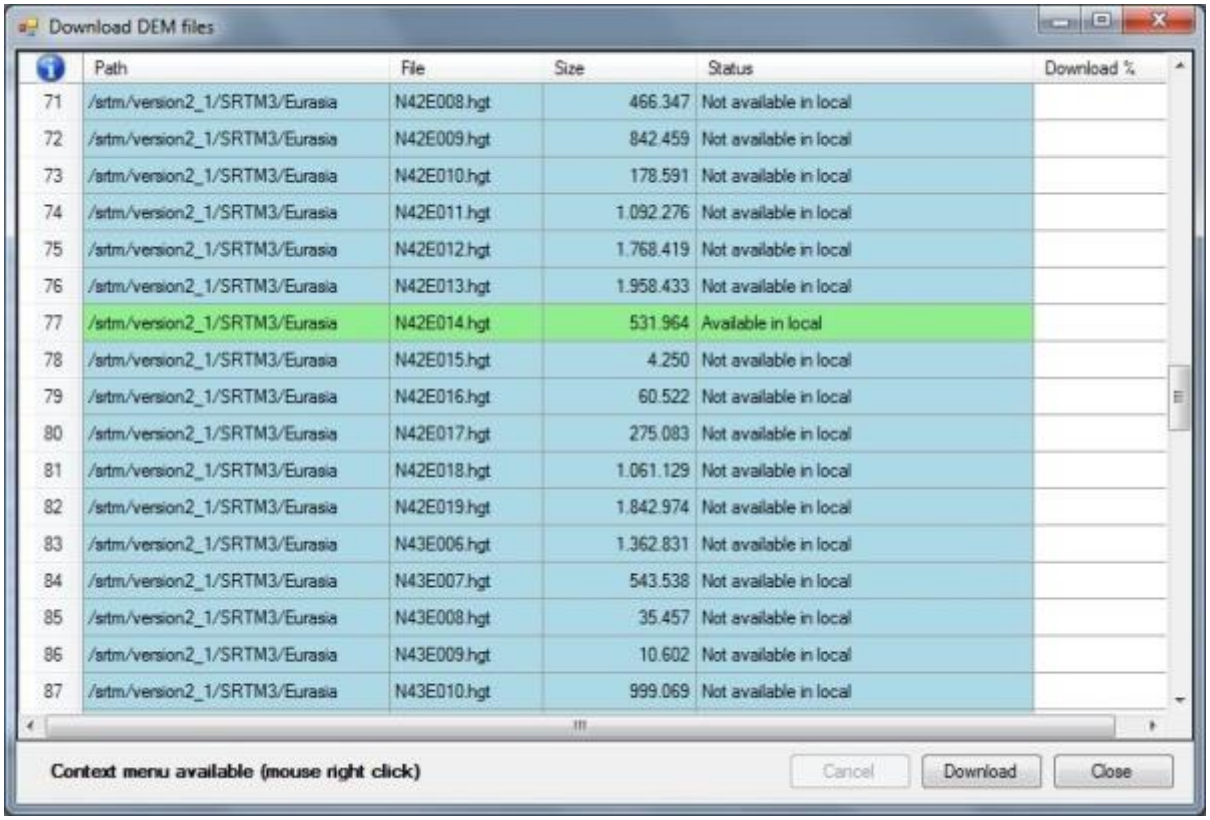
Without browsing to search data covering a particular area (not easy), OkMap can automatically download DEM data, needed to cover a given map previously loaded.

## Download DEM data

To automatically download DEM files, necessary to cover a previously loaded map, use the menu *DEM - Download DEM files*.

A window containing a table with the following information is displayed:

- Relative path of the file on the FTP site
- File name
- File size in bytes
- Status (available, unavailable, downloading)
- Status of download progress in percent


Download DEM files
Path File Size Status Download %
71 /srtm/version2_1/SRTM3/Eurasia N42E008.hgt 466.347 Not available in local
72 /srtm/version2_1/SRTM3/Eurasia N42E009.hgt 842.459 Not available in local
73 /srtm/version2_1/SRTM3/Eurasia N42E010.hgt 178.591 Not available in local
74 /srtm/version2_1/SRTM3/Eurasia N42E011.hgt 1.092.276 Not available in local
75 /srtm/version2_1/SRTM3/Eurasia N42E012.hgt 1.768.419 Not available in local
76 /srtm/version2_1/SRTM3/Eurasia N42E013.hgt 1.958.433 Not available in local
77 /srtm/version2_1/SRTM3/Eurasia N42E014.hgt 531.964 Available in local
78 /srtm/version2_1/SRTM3/Eurasia N42E015.hgt 4.250 Not available in local
79 /srtm/version2_1/SRTM3/Eurasia N42E016.hgt 60.522 Not available in local
80 /srtm/version2_1/SRTM3/Eurasia N42E017.hgt 275.083 Not available in local
81 /srtm/version2_1/SRTM3/Eurasia N42E018.hgt 1.061.129 Not available in local
82 /srtm/version2_1/SRTM3/Eurasia N42E019.hgt 1.842.974 Not available in local
83 /srtm/version2_1/SRTM3/Eurasia N43E006.hgt 1.362.831 Not available in local
84 /srtm/version2_1/SRTM3/Eurasia N43E007.hgt 543.538 Not available in local
85 /srtm/version2_1/SRTM3/Eurasia N43E008.hgt 35.457 Not available in local
86 /srtm/version2_1/SRTM3/Eurasia N43E009.hgt 10.602 Not available in local
87 /srtm/version2_1/SRTM3/Eurasia N43E010.hgt 999.069 Not available in local
Context menu available (mouse right click)
Cancel
Download
Close

For more information about the general use of tables, see the topic Data tables.

To start downloading the file press the *Download* button. The file is being downloaded show a progress bar with the percentage completed in the column *Download%*.

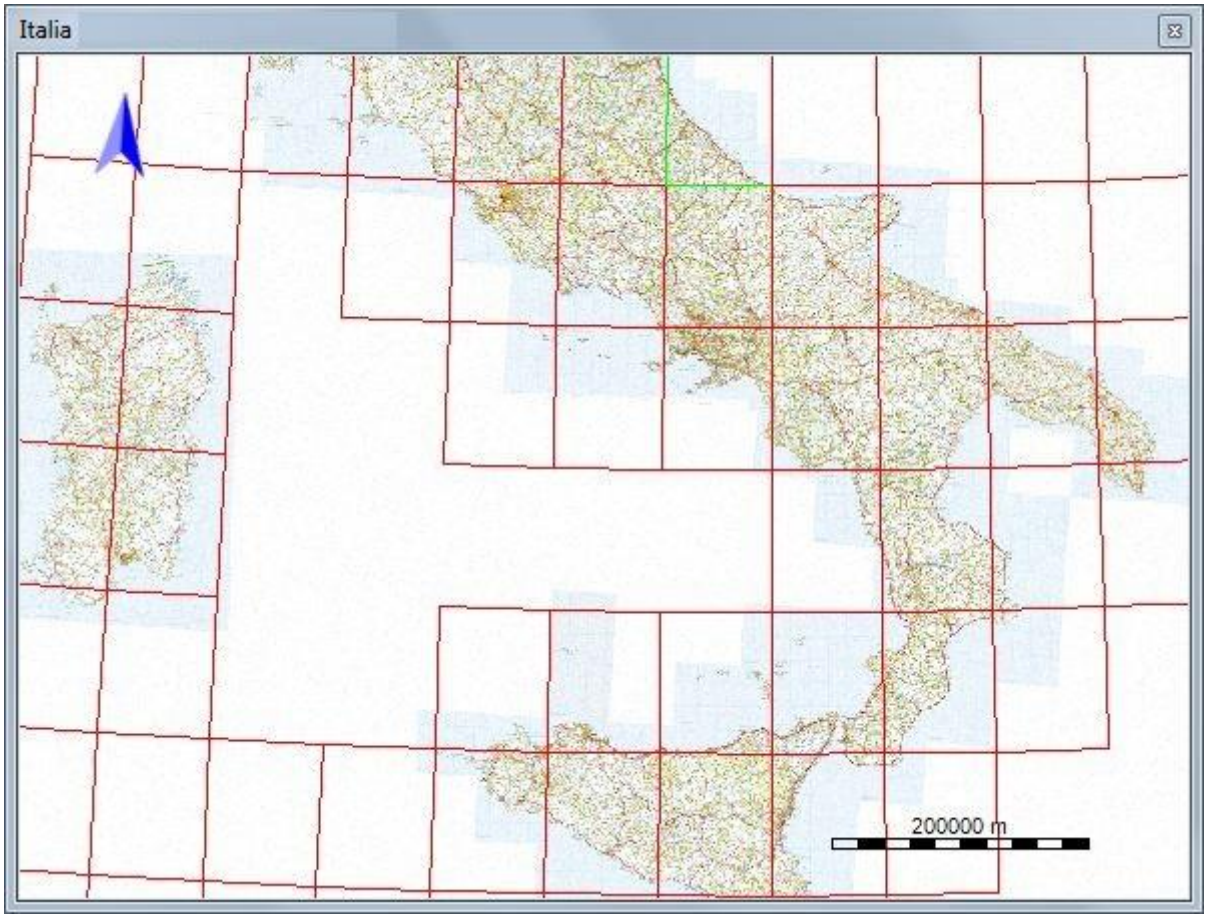
The download can be canceled at any time by pressing the *Cancel* button. The colors of the lines give information on the status:

- Green - Available online
- Celestial - Not available online and ready to be downloaded
- Yellow - Downloading

Download a single file with DEM is possible using a context menu after viewing the bounds of the DEM files.

## Display the bounds of the DEM data

Displays on a map some rectangles representing the bounds of available or downloadable DEM data files.




You can also view and some characteristics and eventually download one of these DEM files according to the needs of the moment.

To display the geographical bounds of the DEM files, available or ready to download, use the menu *DEM - View DEM bounds*.

You can view / hide DEM file names using the menu *DEM - View DEM labels*.

If the function autoinfo (menu *View - Auto info*) is activated, by hovering the mouse on the limits of coverage, you can see a box containing the file name and whether or not available locally.

In any event, to display information about DEM files, you can use the right mouse button, click on the limits of coverage and select the context menu *Info - DEM*. This window will close automatically by clicking on another point on the map.

To download a DEM file use the context menu *Download - DEM*.

# Vectorial data, themes, shapes

## What are the vectorial data

With the vectorial you can define the *graphic* through which is possible to describe an image (in our case a map).

Vectorial data are composed by simple elements (shape) such as points, multipoint, lines and polygons, encoded and stored according to their geographical coordinates.

A point (or multipoint) is identified through its own coordinates (or the coordinates of individual dots that constitute a multipoint), while a line or a polygon by the coordinates of its nodes.

Points (or multipoint) are generally used to describe spatial elements such as poles, trees; the lines are used to describe roads, railways, rivers, curves of level; the polygons are used to describe buildings, lakes, boundaries of cities, regions, nations.

Generally, vectorial data are classified into *themes* such so as to bring together all the roads, buildings, rivers, etc...

The purpose of this classification is that to be able to assign different layouts to different vectorial themes. The layouts provide, for example, the colors, the thickness of the lines and fill colors (backgrounds).

Besides, thanks to this classification, you can select which theme you want to design and which not.

## List the vectorial themes

It is a function that can produce a list of vectorial themes and their characteristics.

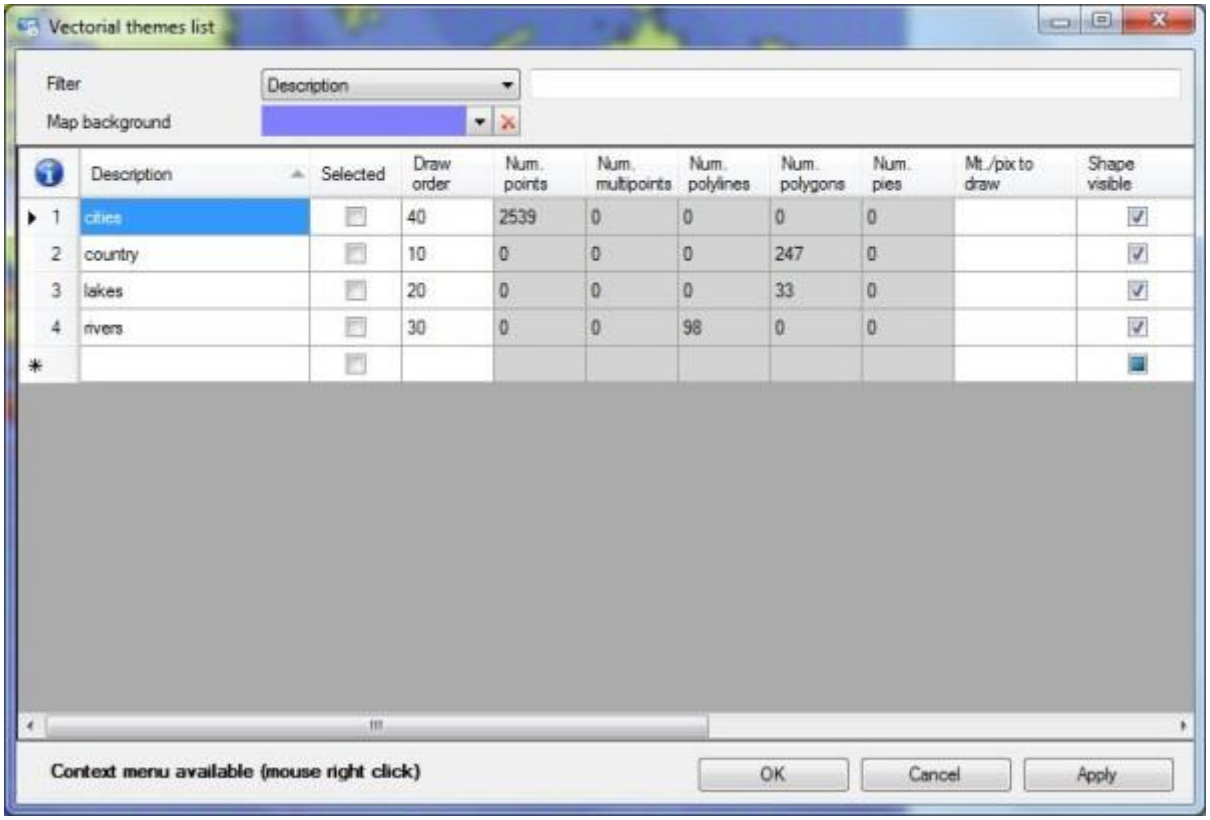
Through this function you can change the properties of the vectorial themes, delete one or more vectorial themes and create new ones.

You can also select a theme or not, changing the value in the *Selected*; select a theme to create new vector objects belonging to it; which is why you can select one theme at a time.

The information displayed in this window are:

- Description of the theme (unique)
- Selected (Yes / No)
- Draw order
- Number of the points (not editable)
- Number of the multipoints (not editable)
- Number of the lines (not editable)
- Number of the polygons (not editable)
- Visible or hidden
- Label visible or hidden
- Shape color
- Line thickness
- Shape fill color
- Opacity of fill color
- Font labels

In this function it’s possible to change also the color of the map background.




To activate this function use the menu *List - Themes*.

Where you see a blue icon with a down arrow means that has been arranged a function for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Color*: opens a dialog box for choosing the color to use to draw the shapes.
- *Color filling*: opens a dialogue box for choosing the color to use to draw the background of the shapes.
- *Thickness line*: opens a dropdown for selecting the line thickness used to draw the lines of the shapes.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the shape.

To delete or to insert the vectorial themes see the topic Data tables.

It is also available a context menu activated with the right mouse button. This menu provides the following functions:

- *Reset color*: cancels selection of the shape color made earlier and restores the use of the color defined at global level in the function Preferences - Vectorial data.
- *Reset fill color*: cancels selection of the shape background color made earlier and restores the use of the color defined at global level in the function Preferences - Vectorial data.
- *Reset font labels*: cancel the choice of a font made earlier and restores the use of the font defined at global level in the function Preferences - Vectorial data.
- *Default grid layout*: restores the default size of the grid columns.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.

To exit without saving the data, press the *Cancel* button.

For more information about the general use of tables, see the topic Data tables.

# Shape type point

## What are point shapes

The *point* belongs to the category of the vectorial objects (shape).

A point is defined through its own coordinates, it is typically used to describe point-like spatial elements as poles, trees.
The point properties managed in OkMap are:

- Membership vectorial theme
- Label
- Selected (Yes / No)
- Visible (Yes / No)
- Shape color
- Shape fill color
- Line thickness
- Font labels
- Geographical coordinates

## Create a point

A point can be created:

- by the importation of vectorial data from another map in OkMap format (.okm)
- by the importation of vectorial data in different format (shape)
- drawing directly on the map

To create it on the map to select, if necessary, the current theme with the function List vectorial themes.

Then select the appropriate tool with the menu *Tools* - *New point* and click with the left mouse button on the map in the desired position.

Subsequently, through the modify function, you can specify the property of the new point.

## Select the points

Select a set of points allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the points you can use one of the following methods:

- Click on the map with the left mouse button on the corresponding drawing.
- In case of overlapping objects, click the right mouse button to select the point and use the context menu *Select* - *point*.
- To add other points to the selection hold down the *Ctrl* key and click on the drawing of the point you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the *Shift* key and left mouse button.
- To add a group of neighboring GPX objects hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with

the right mouse button, *Invert selection*.

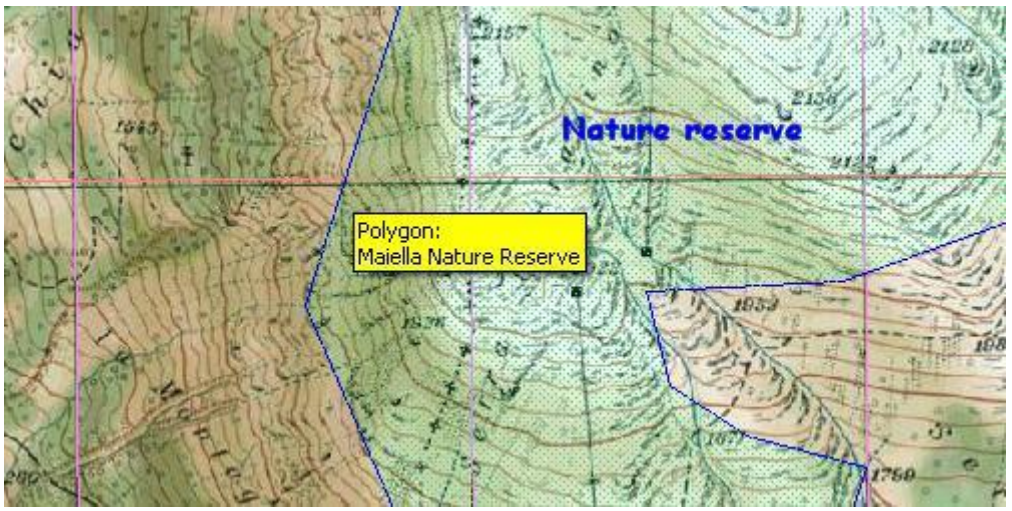
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a point

To obtain information about a point is sufficient, if activated autoinfo (menu *View - Auto info*), place the mouse on its design.

A panel containing the following information is displayed:

- the point label




In any case, you can click the right mouse button on the point and select the context menu *Info - point*.

A window containing the following information will be opened:

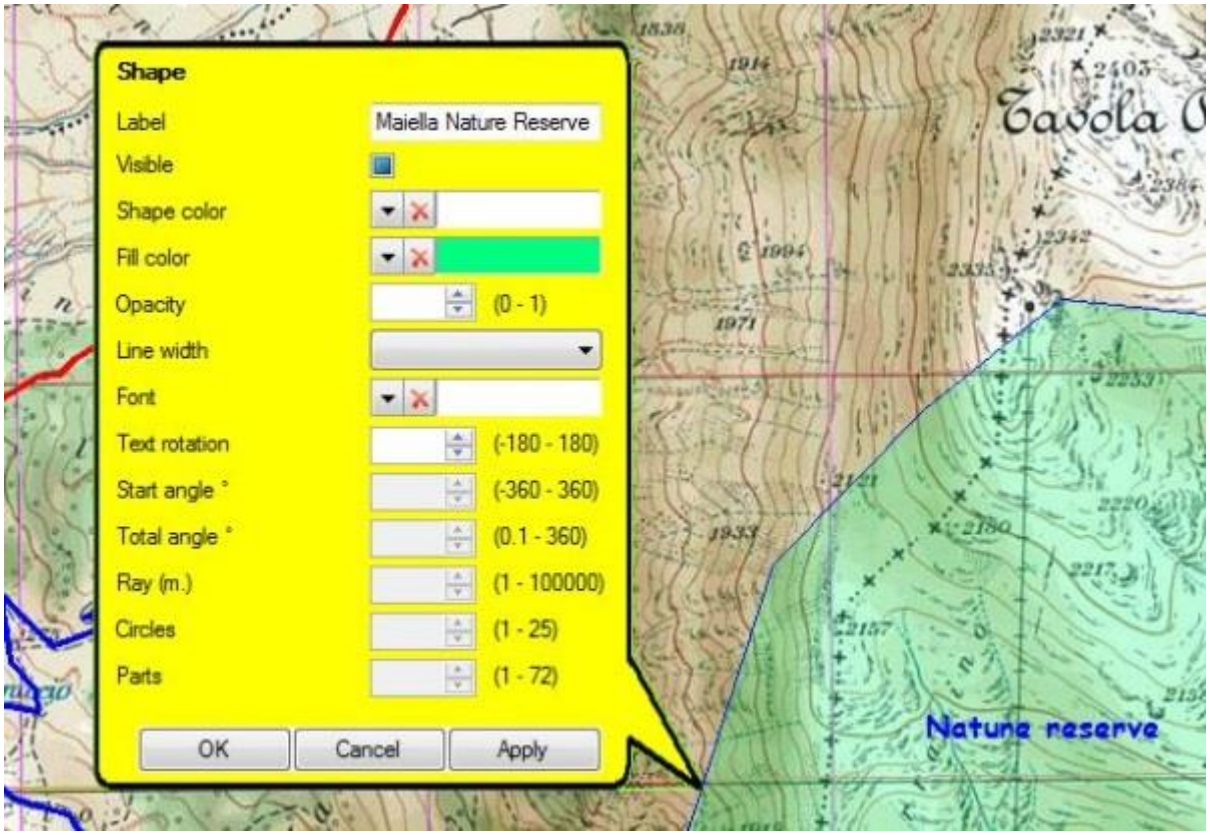
- the point label

This window will automatically close when you click on another point on the map.

## Modify the points

To change the properties of a point click with the right mouse button on the design and select the context menu *Modify - point*.
A window containing the following information is opened:

- Point label
- Visible
- Shape color
- Shape fill color
- Opacity of fill color
- Line thickness
- Font labels
- Text rotation




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

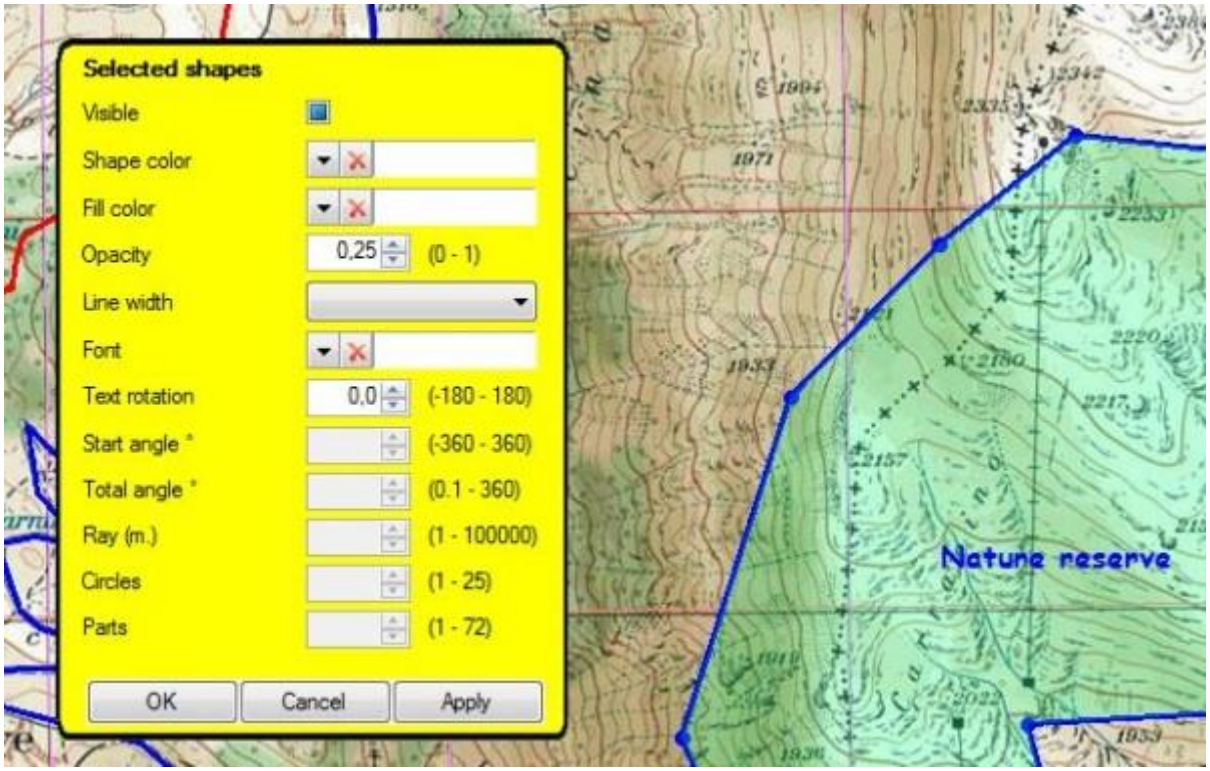
- *Color*: opens a dialog box for choosing the color to use to draw the points.
- *Fill color*: opens a dialog box for choosing the color to use to fill the points.
- *Line thickness*: opens a dropdown for selecting the line thickness to be used in design.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the point.

Where appears an icon with a cross (*Shape color*, *Fill color* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function vectorial themes.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

To modify all the selected points click the right mouse button anywhere on the map and select the context menu *Modify selected - Points*.
A window containing the following information common to multiple points is opened:

- Visible
- Shape color
- Shape fill color
- Opacity of fill color
- Line thickness
- Font labels
- Text rotation




Apply the same considerations to editing a point.

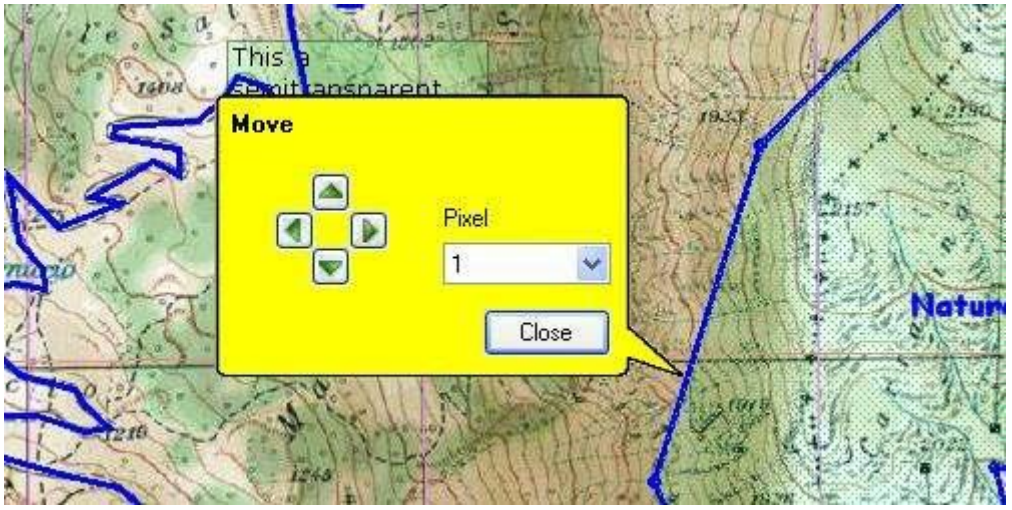
To modify all the selected vectorial data click the right mouse button anywhere on the map and select the context menu select the context menu *Modify selected* - *Vectorial data*.

Apply the same considerations to editing the selected points.

## Move a point

To move a point click with the right mouse button on the draw of the point and to select the context menu *Move* - *point*.

A window is opened with four arrows buttons.




Press the buttons to move the point in the desired direction.
The movement is made of how many pixels are shown in the near combo box.

Alternatively you can click the left mouse button on the object to move, hold and move the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the points

To delete a point, click the map with the right mouse button on the design of the point and select the context menu *Delete - point*.

To delete the selected points, click the right mouse button anywhere on the map and select the context menu *Delete selected - Points*.

To delete all points, click the button right-click anywhere on the map and select the context menu *Delete all - Points*.

In addition, to delete all the vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - Vectorial data*.

Finally, to erase all GPX and vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - All*.

## Hide and unhide the points

To hide a point, click the map with the right mouse button on the design of the point and select the context menu *Hide - point*.

To hide the selected points make click the right mouse button anywhere on the map and select the context menu *Hide selected - Points*.

To unhide all the points click the right mouse button anywhere on the map and select the context menu *Unhide all - Points*.

# Shape type multipoint

## What are multipoint shapes

The *multipoint* belongs to the category of the vectorial objects (shape).

A multipoint is a set of points, it is typically used to describe multiple neighboring point- like spatial elements such as poles, trees.

The multipoint properties managed in OkMap are:

- Membership vectorial theme
- Label
- Selected (Yes / No)
- Visible (Yes / No)
- Shape color
- Shape fill color
- Line thickness
- Font labels
- A list of points with the following properties:
  - Geographical coordinates

## Create a multipoint

A multipoint can be created:

- by the importation of vectorial data from another map in OkMap format (.okm)
- by the importation of vectorial data in different format (shape)
- drawing directly on the map

To create it on the map to select, if necessary, the current theme with the function List vectorial themes.

Then select the appropriate tool with the menu *Tools - New multipoint* and click with the left mouse button on the map in the position relative to the first point of the vectorial shape.

Then proceed to the design of the other points that constitute the multipoint and finally, to close the shape, deselect it.

Subsequently, through the modify function, you can specify the properties of the new multipoint.

## Select the multipoints

Select a set of multipoints allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the multipoints you can use one of the following methods:

- Click on the map with the left mouse button on the corresponding drawing.
- In case of overlapping objects, click the right mouse button on one of the point of the multipoint to select and use the context menu *Select - point*.
- To add other multipoints to the selection hold down the *Ctrl* key and click on a point belonging to the multipoint you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the *Shift* key and left mouse button.

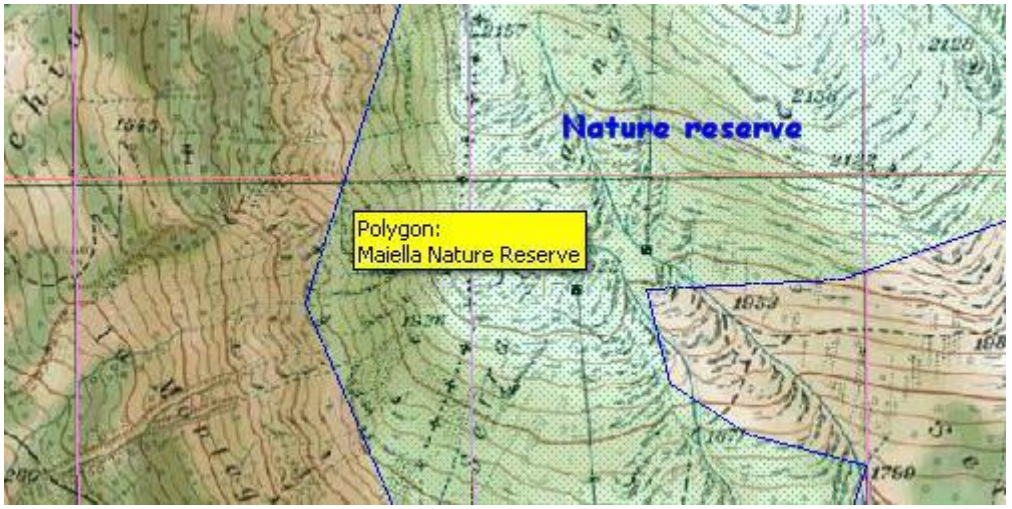
- To add a group of neighboring GPX objects hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a multipoint

To obtain information about a waypoint is sufficient, if activated autoinfo (menu *View* - *Auto info*), place the mouse on one of the points that compose the multipoint.

A panel containing the following information is displayed:

- the multipoint label




In any case, you can click the right mouse button on one of the points that compose the multipoint and select the context menu *Info* - *multipoint*.

A window containing the following information will be opened:

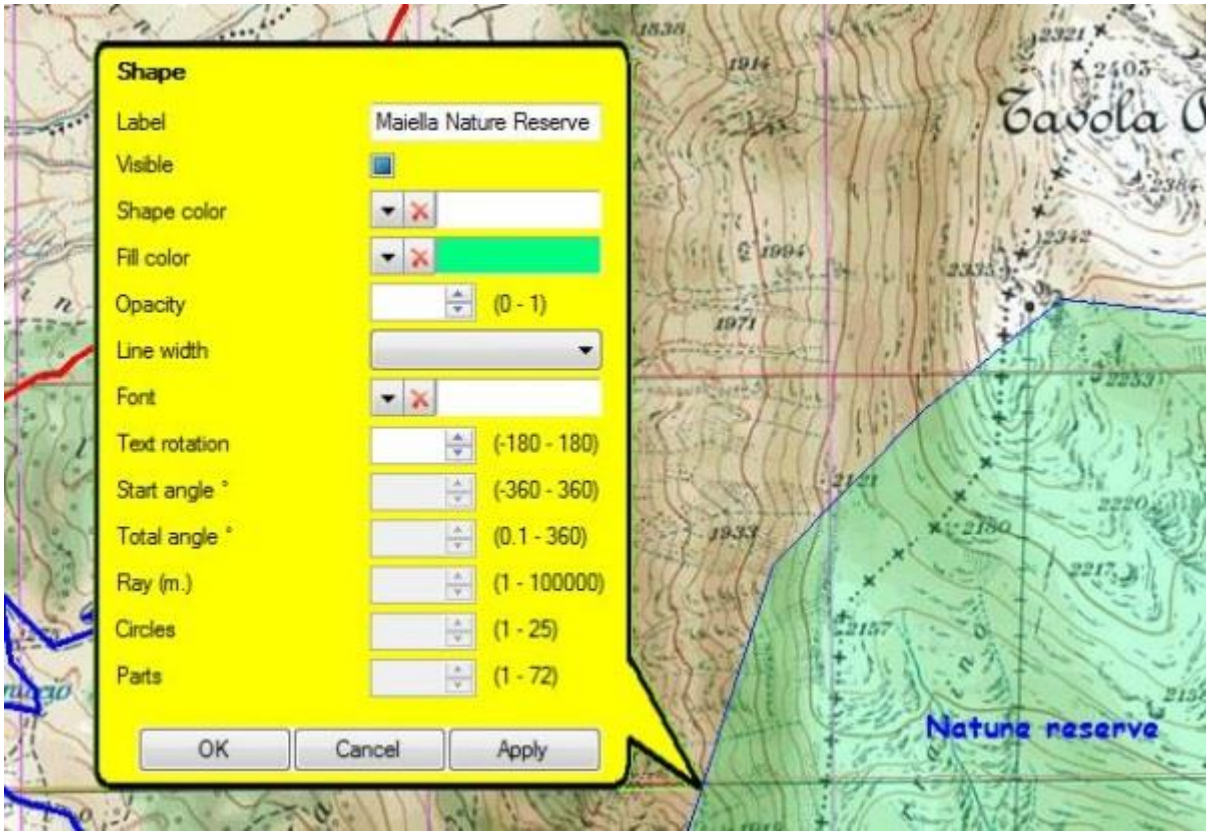
- the multipoint label
- the numbers of the points

This window will automatically close when you click on another point on the map.

## Modify the multipoints

To change the properties of a multipoint click with the right mouse button on one of the points that compose the multipoint and select the context menu *Modify - multipoint*.
A window containing the following information is opened:

- Multipoint label
- Visible
- Shape color
- Shape fill color
- Opacity of fill color
- Line thickness
- Font labels
- Text rotation




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Color*: opens a dialog box for choosing the color to use to draw the points.
- *Fill color*: opens a dialog box for choosing the color to use to fill the points.
- *Line thickness*: opens a dropdown for selecting the line thickness to be used in design.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the multipoint.

Where appears an icon with a cross (*Shape color*, *Fill color* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function vectorial themes.

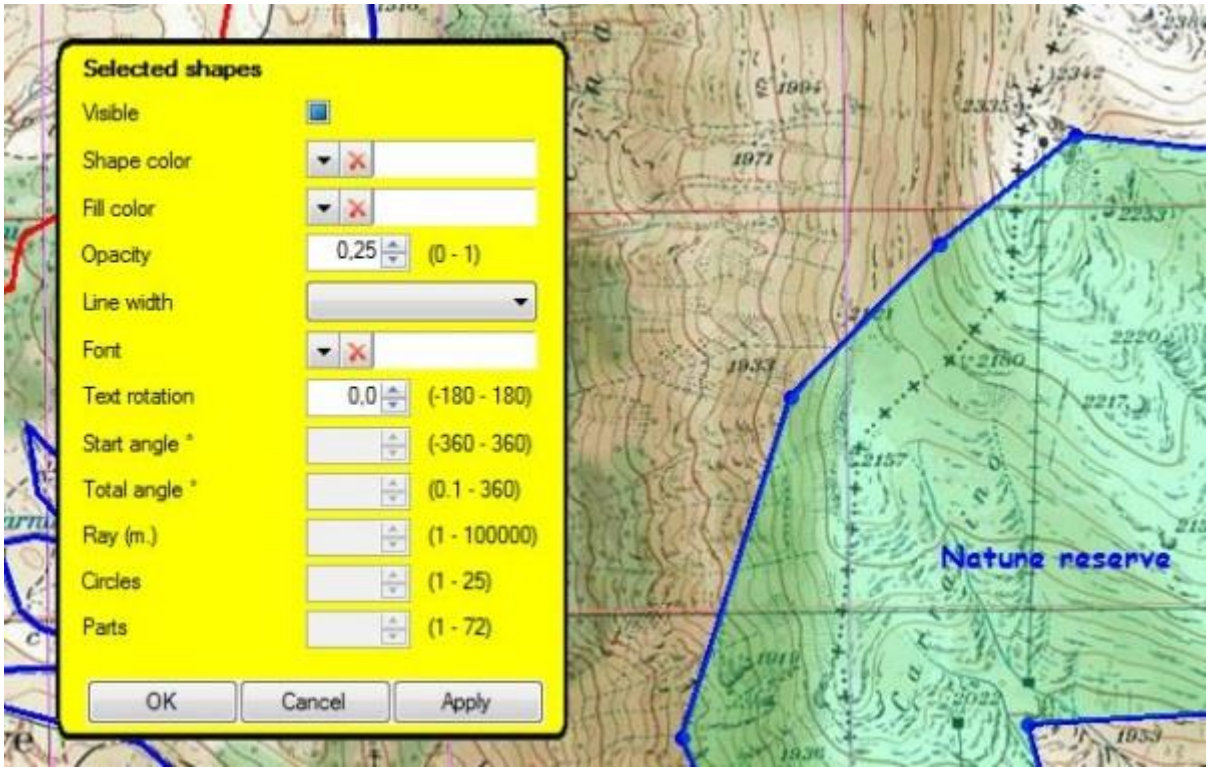
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.

To exit without saving the data, press the *Cancel* button.

To modify all the selected multipoints click the right mouse button anywhere on the map and select the context menu *Modify selected - Multipoints*.

A window containing the following information common to multiple multipoints is opened:

- Visible
- Shape color
- Shape fill color
- Opacity of fill color
- Line thickness
- Font labels
- Text rotation




Apply the same considerations to editing a multipoint.

To modify all the selected vectorial data click the right mouse button anywhere on the map and select the context menu select the context menu *Modify selected - Vectorial data*.

Apply the same considerations to editing the selected multipoints.

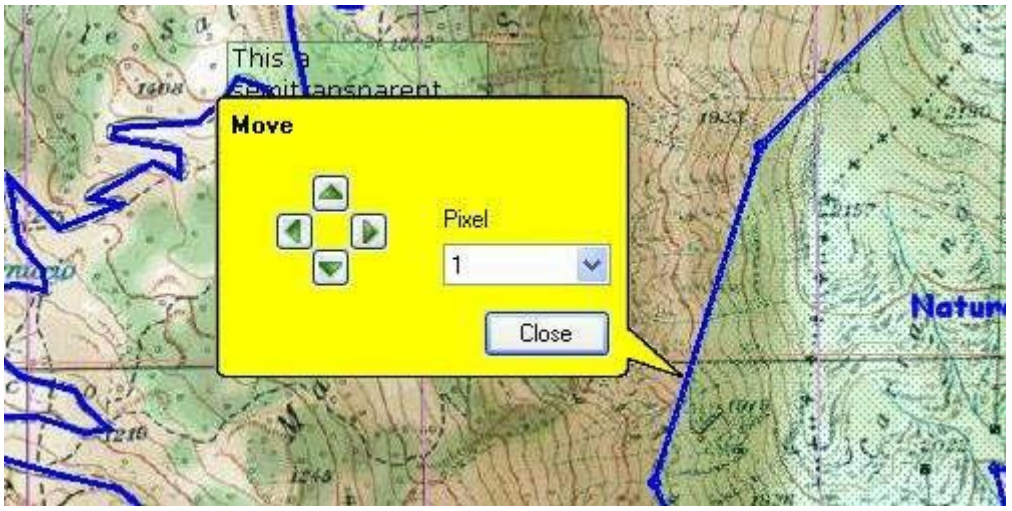
## Add a point to a multipoint

To add a point to a multipoint, select the multipoint, then select the appropriate tool with the menu *Tools - New multipoint* and finally click with the left mouse button on the map in the desired position.

## Move a multipoint

To move a multipoint click with the right mouse button on one of the point of the multipoint and select the context menu *Move - multipoint*.

A window is opened with four arrows buttons.




Press the buttons to move the multipoint in the desired direction.
The movement is made of how many pixels are shown in the near combo box. Alternatively you can click the left mouse button on the object to move, hold and move the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the multipoints

To delete a point, click the map with the right mouse button on the design of one of the point of the multipoint and select the context menu *Delete - multipoint*.

To delete the selected multipoints, click the right mouse button anywhere on the map and select the context menu *Delete selected - Multipoints*.

To delete all multipoints, click the button right-click anywhere on the map and select the context menu *Delete all - Multipoints*.

In addition, to delete all the vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - Vectorial data*.

Finally, to erase all GPX and vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - All*.

## Hide and unhide the multipoints

To hide a multipoint, click the map with the right mouse button on one of the points of the multipoint and select the context menu *Hide - multipoint*.

To hide the selected multipoints make click the right mouse button anywhere on the map and select the context menu *Hide selected - Multipoints*.

To unhide all the multipoints click the right mouse button anywhere on the map and select the context menu *Unhide all - Multipoints*.

# Shape type line

## What are line shapes

The *line* belongs to the category of the vectorial objects (shape).

A line (broken) is a set of points that define its nodes; it is commonly used to describe spatial elements such as roads, railways, rivers, curves of level.
The line properties managed in OkMap are:

- Membership vectorial theme
- Label
- Selected (Yes / No)
- Visible (Yes / No)
- Shape color
- Line thickness
- Font labels
- A list of points (knots) with the following properties:
  - Geographical coordinates

## Create a line

A line can be created:

- by the importation of vectorial data from another map in OkMap format (.okm)
- by the importation of vectorial data in different format (shape)
- drawing directly on the map

To create it on the map to select, if necessary, the current theme with the function List vectorial themes.

Then select the appropriate tool with the menu *Tools* - *New line* and click with the left mouse button on the map in the position relative to the first point of the vectorial shape.

Then proceed to the design of the other points that constitute the line and finally, to close the shape, deselect it.

Subsequently, through the modify function, you can specify the properties of the new line.

## Select the lines

Select a set of lines allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the lines you can use one of the following methods:

- Click on the map with the left mouse button on the corresponding drawing.
- In case of overlapping objects, click the right mouse button to select the line and use the context menu *Select* - *line*.
- To add other lines to the selection hold down the *Ctrl* key and click on the drawing of the line you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the *Shift* key and left mouse button.
- To add a group of neighboring GPX objects hold down the *Ctrl* and *Shift* keys and

draw a rectangle as in the previous case.

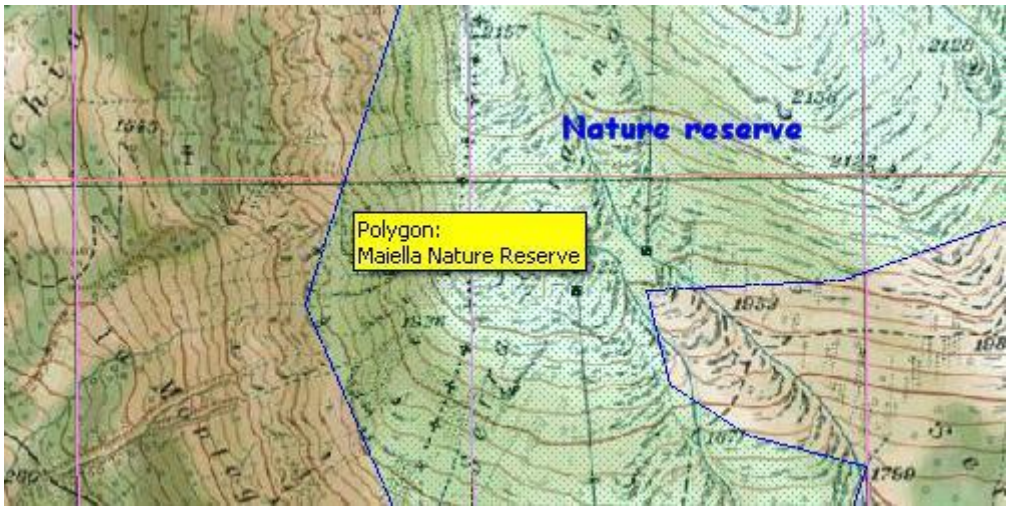
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a line

To obtain information about a line is sufficient, if activated autoinfo (menu *View - Auto info*), place the mouse on its design.

A panel containing the following information is displayed:

- the line label




In any case, you can click the right mouse button on the line and select the context menu *Info - line*.

A window containing the following information will be opened:

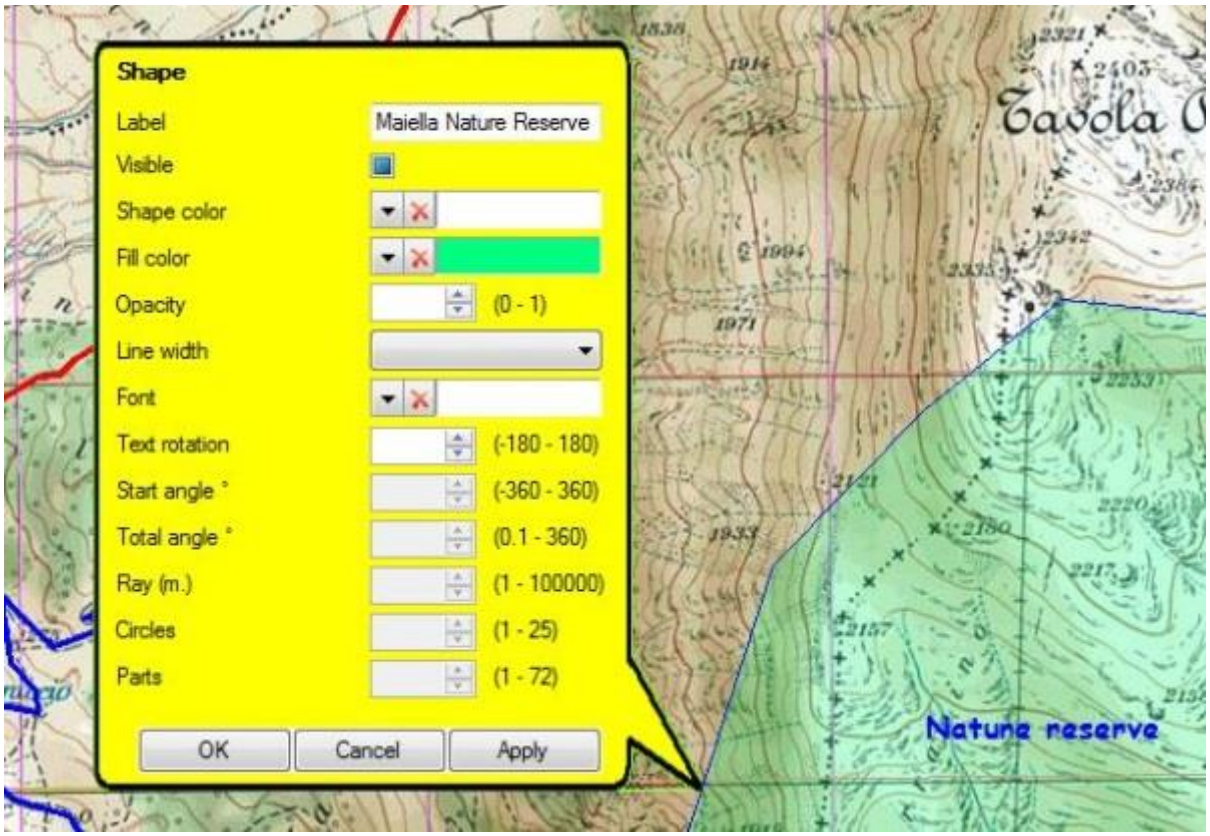
- the line label
- the numbers of the parts
- the numbers of the points
- the line length

This window will automatically close when you click on another point on the map.

## Modify the lines

To change the properties of a line click with the right mouse button on the design and select the context menu *Modify - line*.
A window containing the following information is opened:

- Line label
- Visible
- Shape color
- Line thickness
- Font labels
- Text rotation




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Color*: opens a dialog box for choosing the color to use to draw the line.
- *Line thickness*: opens a dropdown for selecting the line thickness to be used in design.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the line.

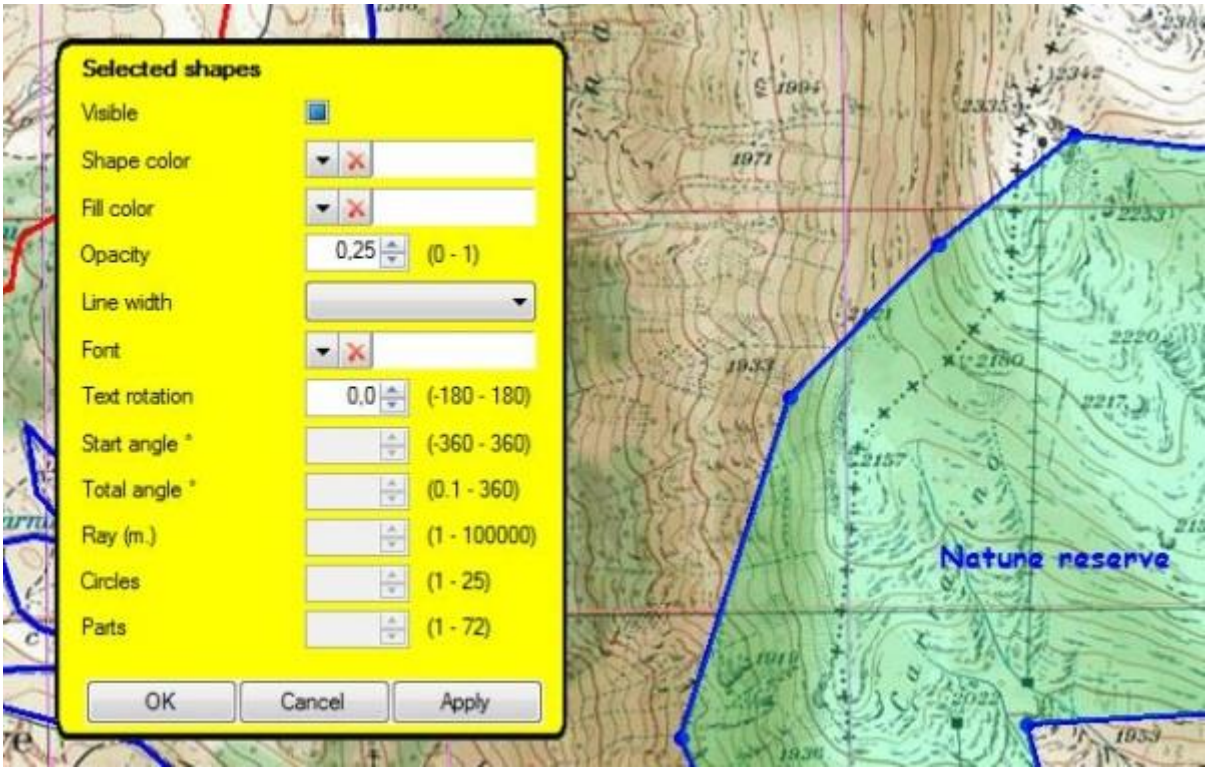
Where appears an icon with a cross (*Shape color* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function vectorial themes.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

To modify all the selected lines click the right mouse button anywhere on the map and select the context menu *Modify selected - Lines*.

A window containing the following information common to multiple lines is opened:

- Visible
- Shape color
- Line thickness
- Font labels
- Text rotation




Apply the same considerations to editing a line.

To modify all the selected vectorial data click the right mouse button anywhere on the map and select the context menu select the context menu *Modify selected* - *Vectorial data*.

Apply the same considerations to editing the selected lines.

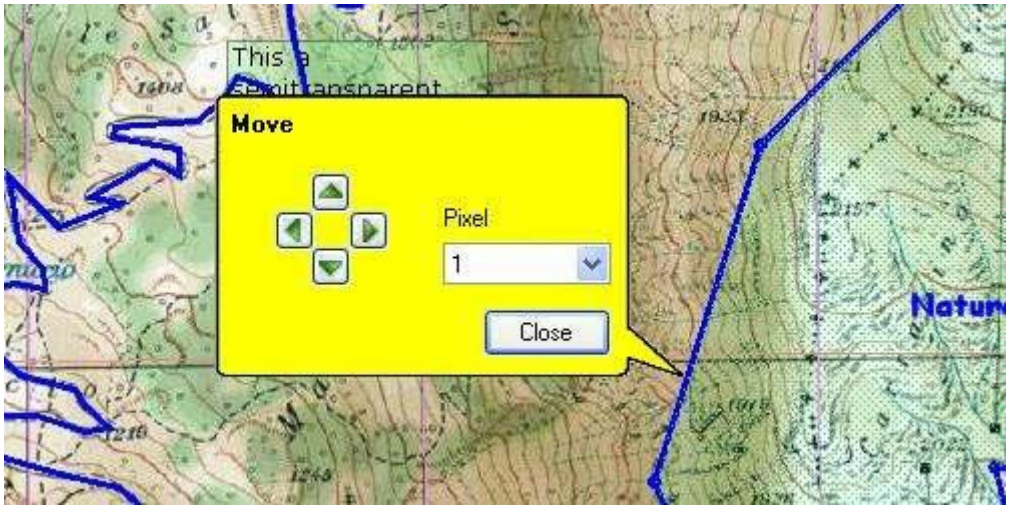
## Add a point to a line

To add a point to a line, select the line, then select the appropriate tool with the menu *Tools* - *New line* and finally click with the left mouse button on the map in the desired position.

## Move a line

To move a line click with the right mouse button on the draw of the line and to select the context menu *Move* - *point*.

A window is opened with four arrows buttons.




Press the buttons to move the line in the desired direction.
The movement is made of how many pixels are shown in the near combo box. Alternatively you can click the left mouse button on the object to move, hold and move
the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the lines

To delete a line, click the map with the right mouse button on the design of the line and select the context menu *Delete - line*.

To delete the selected lines, click the right mouse button anywhere on the map and select the context menu *Delete selected - Lines*.

To delete all lines, click the button right-click anywhere on the map and select the context menu *Delete all - Lines*.

In addition, to delete all the vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - Vectorial data*.

Finally, to erase all GPX and vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - All*.

## Hide and unhide the lines

To hide a line, click the map with the right mouse button on the design of the line and select the context menu *Hide - line*.

To hide the selected lines make click the right mouse button anywhere on the map and select the context menu *Hide selected - Lines*.

To unhide all the lines click the right mouse button anywhere on the map and select the context menu *Unhide all - Lines*.

# Shape type polygon

## What are polygon shapes

The *polygon* to the category of the vectorial objects (shape).

A polygon (closed broken line) is a set of points that define its nodes; it is commonly used to describe spatial elements such as buildings, lakes, boundaries of cities, regions and countries.

The polygon properties managed in OkMap are:

- Membership vectorial theme
- Label
- Selected (Yes / No)
- Visible (Yes / No)
- Shape color
- Shape fill color
- Line thickness
- Font labels
- A list of points (knots) with the following properties:
  - Geographical coordinates

## Create a polygon

A polygon can be created:

- by the importation of vectorial data from another map in OkMap format (.okm)
- by the importation of vectorial data in different format (shape)
- drawing directly on the map

To create it on the map to select, if necessary, the current theme with the function List vectorial themes.

Then select the appropriate tool with the menu *Tools* - *New polygon* and click with the left mouse button on the map in the position relative to the first point of the vectorial shape.

Then proceed to the design of the other points that constitute the polygon and finally, to close the shape, deselect it.

Subsequently, through the modify function, you can specify the properties of the new line.

## Select the polygons

Select a set of polygons allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the polygons you can use one of the following methods:

- Click on the map with the left mouse button on the corresponding drawing.
- In case of overlapping objects, click the right mouse button to select the polygon and use the context menu *Select* - *polygon*.
- To add other polygons to the selection hold down the *Ctrl* key and click on the drawing of the polygon you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down

the *Shift* key and left mouse button.

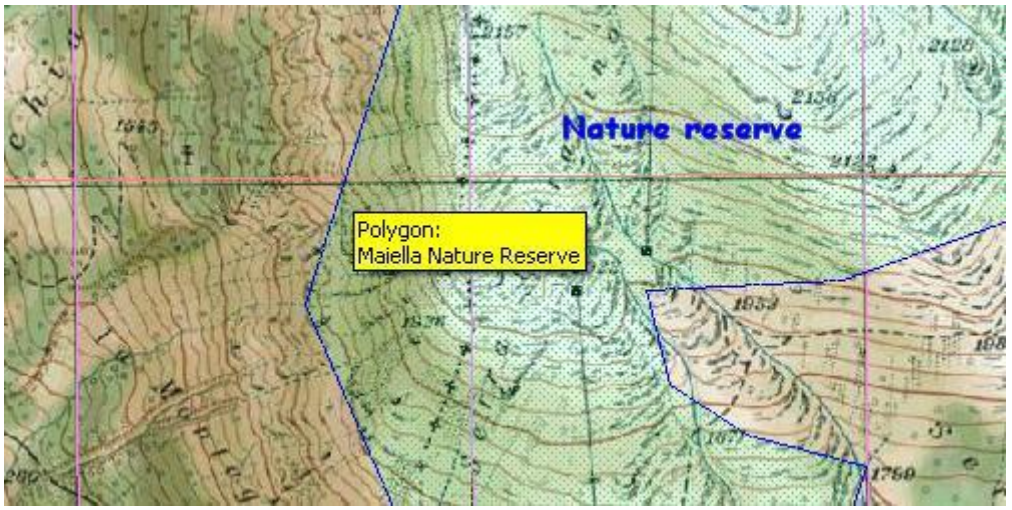
- To add a group of neighboring GPX objects hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a polygon

To obtain information about a polygon is sufficient, if activated autoinfo (menu *View* - *Auto info*), place the mouse on its design.

A panel containing the following information is displayed:

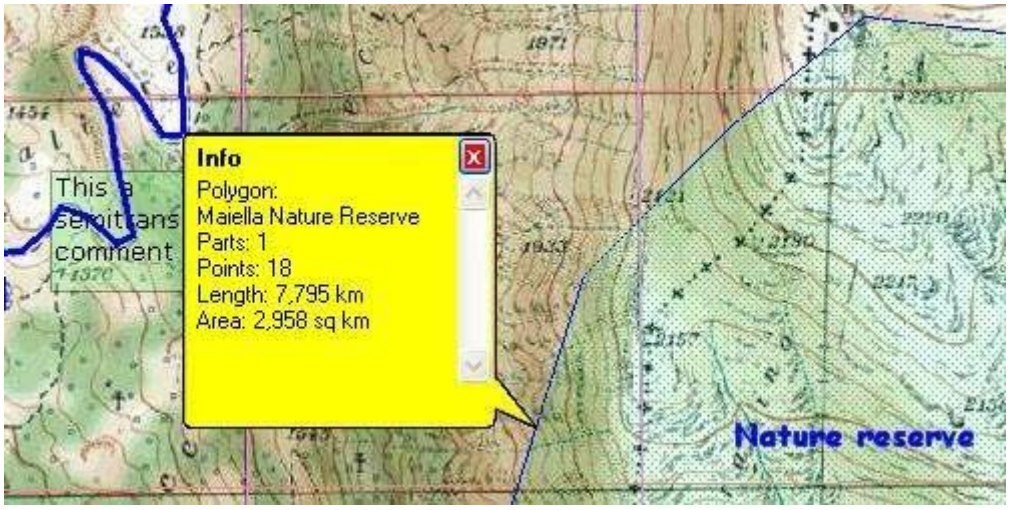
- the polygon label




In any case, you can click the right mouse button on the polygon and select the context menu *Info* - *polygon*.

A window containing the following information will be opened:

- the polygon label
- the numbers of the parts
- the numbers of the points
- the perimeter length
- the area

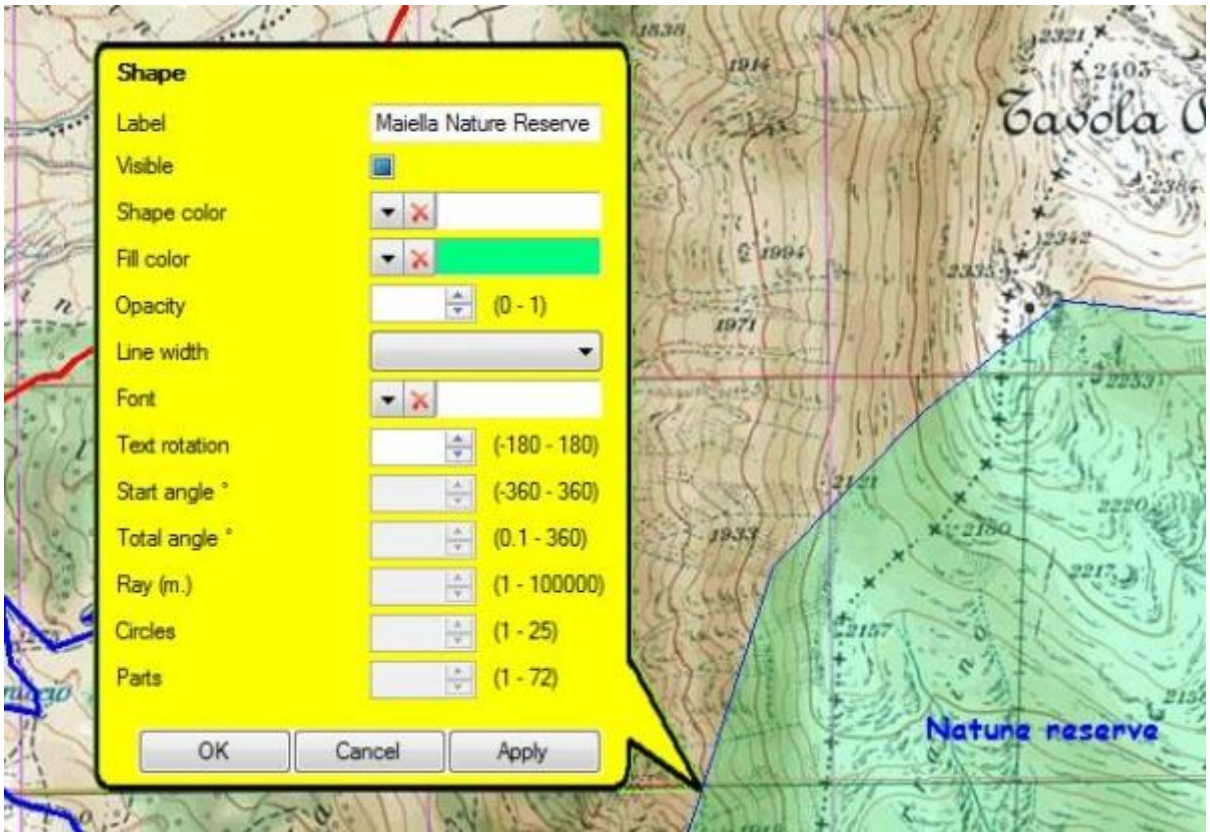



This window will automatically close when you click on another point on the map.

## Modify the polygons

To change the properties of a polygon click with the right mouse button on the design and select the context menu *Modify - polygon*.
A window containing the following information is opened:

- Polygon label
- Visible
- Shape color
- Shape fill color
- Opacity of fill color
- Line thickness
- Font labels
- Text rotation



Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

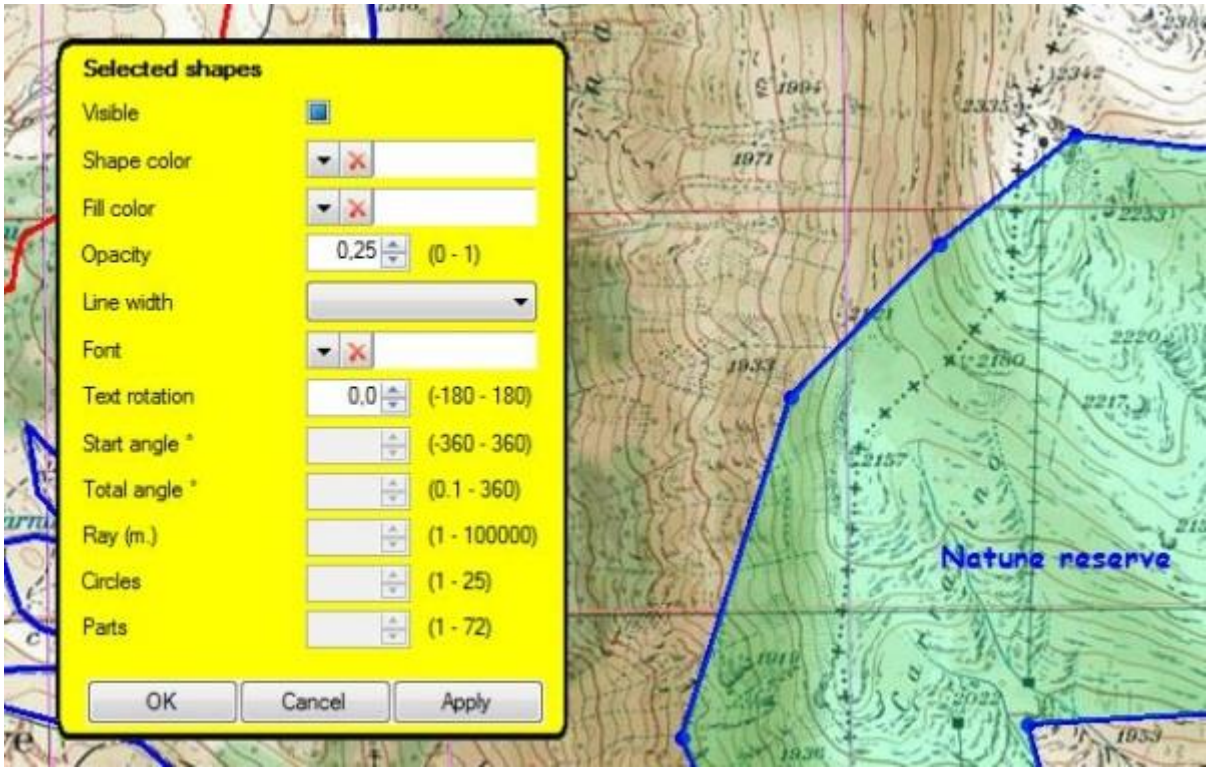
- *Color*: opens a dialog box for choosing the color to use to draw the polygon.
- *Fill color*: opens a dialog box for choosing the color to use to fill the polygon.
- *Line thickness*: opens a dropdown for selecting the line thickness to be used in design.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the polygon.

Where appears an icon with a cross (*Color shape*, *Fill color* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function vectorial themes.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

To modify all the selected polygons click the right mouse button anywhere on the map and select the context menu *Modify selected - Polygons*.
A window containing the following information common to multiple polygons is opened:

- Visible
- Shape color
- Shape fill color
- Opacity of fill color
- Line thickness
- Font labels
- Text rotation




Apply the same considerations to editing a polygon.

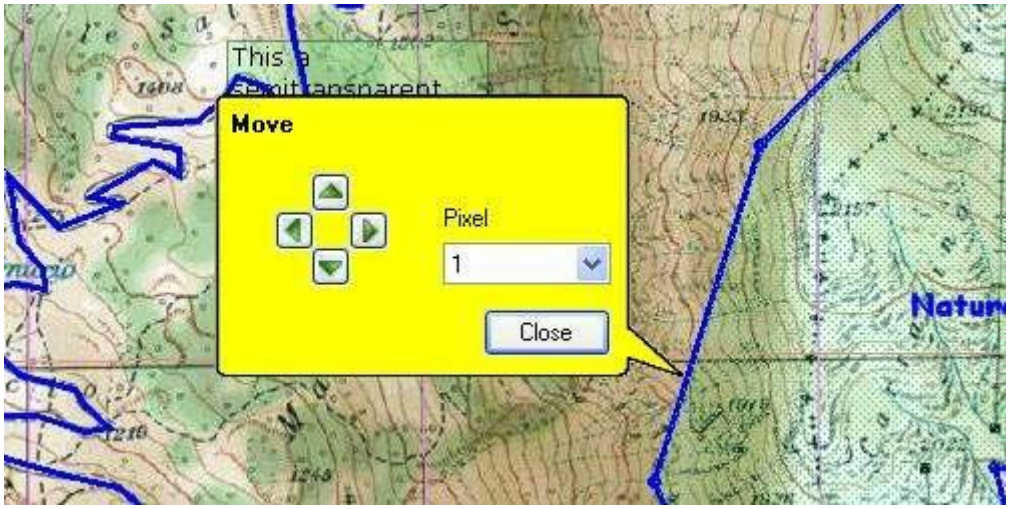
To modify all the selected vectorial data click the right mouse button anywhere on the map and select the context menu select the context menu *Modify selected* - *Vectorial data*.

Apply the same considerations to editing the selected polygons.

## Move a polygon

To move a polygon click with the right mouse button on the draw of the polygon and to select the context menu *Move* - *point*.

A window is opened with four arrows buttons.




Press the buttons to move the polygon in the desired direction.
The movement is made of how many pixels are shown in the near combo box. Alternatively you can click the left mouse button on the object to move, hold and move
the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Add a point to a polygon

To add a point to a polygon, select the polygon, then select the appropriate tool with the menu *Tools* - *New polygon* and finally click with the left mouse button on the map in the desired position.

## Delete the polygons

To delete a polygon, click the map with the right mouse button on the design of the polygon and select the context menu *Delete* - *polygon*.

To delete the selected polygons, click the right mouse button anywhere on the map and select the context menu *Delete selected* - *Polygons*.

To delete all polygons, click the button right-click anywhere on the map and select the context menu *Delete all* - *Polygons*.

In addition, to delete all the vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all* - *Vectorial data*.

Finally, to erase all GPX and vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all* - *All*.

## Hide and unhide the polygons

To hide a polygon, click the map with the right mouse button on the design of the polygon and select the context menu *Hide - polygon*.

To hide the selected polygons make click the right mouse button anywhere on the map and select the context menu *Hide selected - Polygons*.

To unhide all the polygons click the right mouse button anywhere on the map and select the context menu *Unhide all - Polygons*.

# Map add-ons

## What are the map add-ons

The map add-ons allow you to add *graphic objects* on the map of the following types:

- Icons
- Comments

The add-on go to be part of the design of the map (persistent) and are treated similarly to vectorial objects.

They are useful to:

- Add a small picture (icon) in a precise point on the map
- Add text information to a map (comment)
- Add links to sites that report information concerning a particular point on the map (icons and comments)
- Add references to a file in a particular point on the map (icons and comments); the file can be opened with a simple click of the mouse

# Map icon

## What are the map icons

Map icon belongs to the category of add-on maps.

An icon is a small map image and is typically used to add information on a map.

The properties of a map icon are:

- Description
- Comment
- Associated file
- External link
- Visible yes/no
- Bitmap
- Geographic coordinates

## Create a map icon

A map icon can be created directly on the design of the map.

To do this select the appropriate tool with the menu *Tools* - *New map icon* and click with the left mouse button on the map in the desired position.

Subsequently, through the edit function, you can specify the properties of the new icon.

## Select a map icon

Select a set of map icons allows you to perform group operations such as deleting multiple objects simultaneously.

To select map icons you can use one of the following methods:

- Click on the map with the left mouse button on the corresponding drawing. In the case of overlapping objects, click the right mouse button to select the map icon and use the context menu *Select* - *map icon*.
- 
- To add other map icons to the selection, hold down the *Ctrl* key and click on the map icon you want to add.
- To select a group of neighboring map icons, draw a rectangle by holding down the *Shift* key and left mouse button.
- To add a group of neighboring map icons hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a map icon

To obtain information on a map icon is sufficient, if activated autoinfo (menu *View* - *Autoinfo*), place the mouse on its design.

A panel containing the following information is displayed:

- description
- comment
- associated file

In any case, you can click the right mouse button on the map icon design and select the context menu *Info - map icon*.

A window containing the following information will be opened:

- description
- comment
- bitmap file
- associated file (can be opened pressing the *Open file* button)
- link (url) that can be opened making click with the left key of the mouse

This window will automatically close when you click on another point on the map.

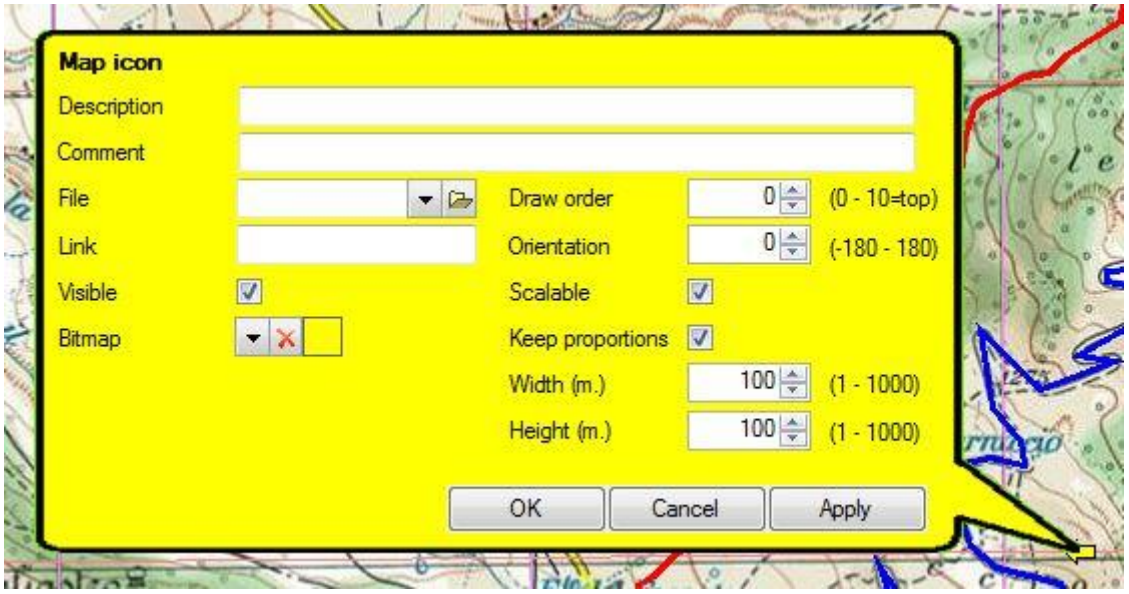
## Modify the map icons

To change the properties of a map comment click with the right mouse button on the design of the comment and select the context menu *Modify - map comment*.

The following window is opened:

- Description
- Comment
- Associated file
- External link

- Visible yes/no
- Bitmap file
- Draw order
- Orientation
- Scalable
- Keep proportions
- Width in meters
- Height in meters




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *File*: opens a dialog box for choosing the file to associate with the icon.
- *Bitmap*: opens a dialog box for choosing the image file to be used for the representation of the icon.

Where appears an icon with a cross (*Bitmap*) means that means that you want to delete the choice made previously, and restore the default specified in the function Preferences – Map icons.

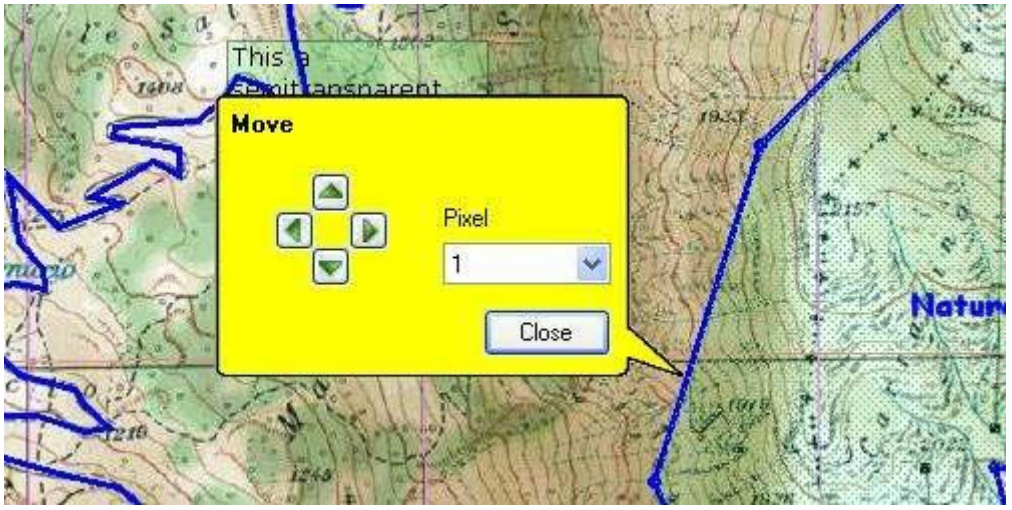
Where it appears an icon with an exclamation point (*File*) you can open the file with the associated application (based on file extension).

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Move a map icon

To move a map icon click with the right mouse button on the design of the icon and select the context menu *Move - map icon*.

A window is opened with four arrows buttons.




Press the buttons to move the map icon in the desired direction.
The movement is made of how many pixels are shown in the near combo box. Alternatively you can click the left mouse button on the object to move, hold and move
the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the map icons

To delete a map icon, click the map with the right mouse button on the design of the icon and select the context menu *Delete - map icon*.

To delete the selected map icons, click the right mouse button anywhere on the map and select the context menu *Delete selected - Map icons*.

To delete all map icons, click the button right-click anywhere on the map and select the context menu *Delete all - Map icons*.

## Hide and unhide the map icons

To hide a map icon click on the map with the right mouse button on the design of the icon and select the context menu *Hide - Map icon*.

To hide the selected map icons click the right mouse button anywhere on the map and select the context menu *Hide selected - Map icons*.

To unhide all the map icons click the right mouse button anywhere on the map and select the context menu *Unhide all - Map icons*.

# Map comment

## What are the map comments

Map comment belongs to the category of add-on maps.

A map comment is a box with text inside and is typically used to add information on a map.

The properties of a map comment are:

- Description
- Comment
- Associated file
- External link
- Visible yes/no
- Font
- Background color
- Border color
- Border line thickness
- Opacity factor
- Box size
- Geographic coordinates

## Create a map comment

A map comment can be created directly on the design of the map.

To do this select the appropriate tool with the menu *Tools - New map comment* and click with the left mouse button on the map in the desired position.

Subsequently, through the edit function, you can specify the properties of the new comment.

## Select a map comment

Select a set of map comments allows you to perform group operations such as deleting multiple objects simultaneously.

To select map comments you can use one of the following methods:

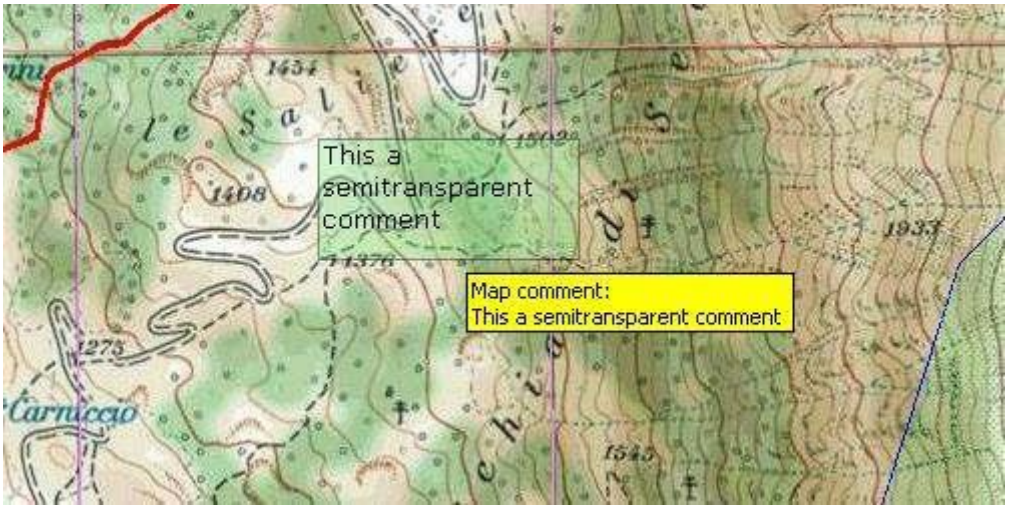
- Click on the map with the left mouse button on the corresponding drawing. In the case of overlapping objects, click the right mouse button to select the map comment and use the context menu *Select - map comment*.
- To add other map comments to the selection, hold down the *Ctrl* key and click on the map comment you want to add.
- To select a group of neighboring map comments, draw a rectangle by holding down the *Shift* key and left mouse button.
- To add a group of neighboring map comments hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a map comment

To obtain information on a map comment is sufficient, if activated autoinfo (menu *View - Autoinfo*), place the mouse on its design.

A panel containing the following information is displayed:

- description
- comment
- associated file




In any case, you can click the right mouse button on the map icon design and select the context menu *Info - map comment*.

A window containing the following information will be opened:

- description
- comment
- associated file (can be opened pressing the *Open file* button)
- link (url) that can be opened making click with the left key of the mouse

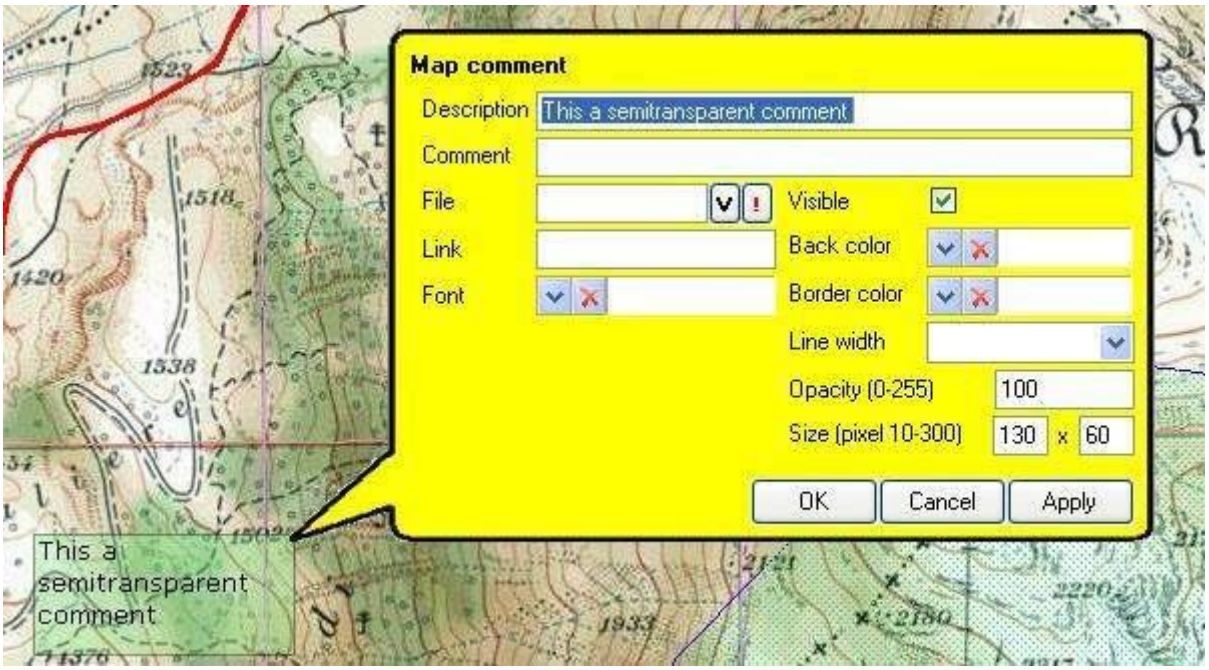
This window will automatically close when you click on another point on the map.

## Modify the map comments

To change the properties of a map icon click with the right mouse button on the design of the icon and select the context menu *Modify - map icon*.

A window containing the following information is opened:

- Description
- Comment
- Associated file
- External link
- Visible yes/no
- Font
- Background color
- Border color
- Border line thickness
- Opacity factor
- Box size




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *File*: opens a dialog box for choosing the file to associate with the comment.
- *Font*: opens a dialog box for choosing the font to use for the representation of the comment.
- *Background color*: opens a dialog box for choosing the color to use as the background of the comment.
- *Border color*: opens a dialog box for choosing the color to use in the design of the box border of the comment.
- *Line thickness*: opens a list to choice the thickness of the lines used in the design of the box border.

Where appears an icon with a cross (*Background color*, *Border color* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function Preferences – Map comments.

Where it appears an icon with an exclamation point (*File*) you can open the file with the associated application (based on file extension).

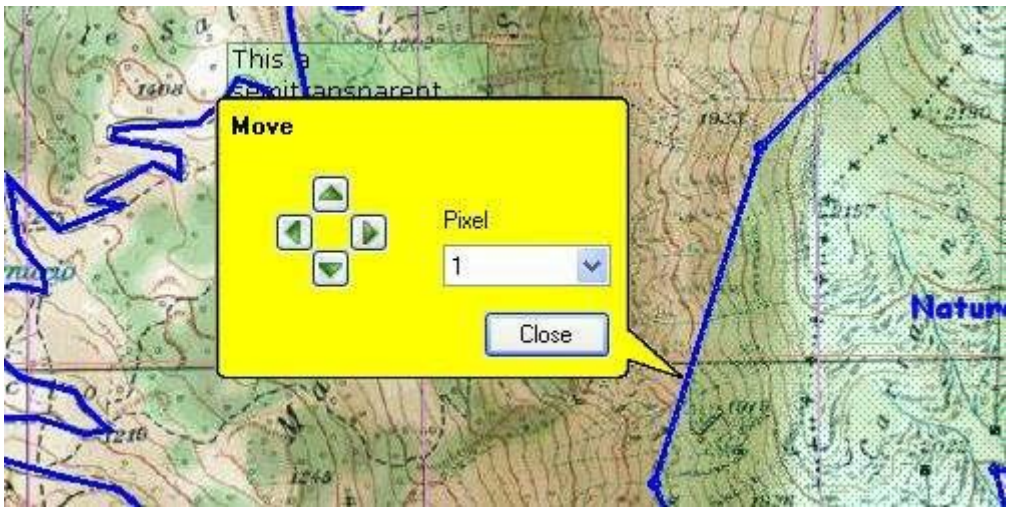
To save the modified data press the *Apply* button.

To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Move a map comment

To move a map comment click with the right mouse button on the design of the comment and select the context menu *Move - map comment*.

A window is opened with four arrows buttons.




Press the buttons to move the map comment in the desired direction.
The movement is made of how many pixels are shown in the near combo box. Alternatively you can click the left mouse button on the object to move, hold and move the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the map comments

To delete a map comment, click the map with the right mouse button on the design of the comment and select the context menu *Delete - map comment*.

To delete the selected map comments, click the right mouse button anywhere on the map and select the context menu *Delete selected - Map comments*.

To delete all map comments, click the button right-click anywhere on the map and select the context menu *Delete all - Map comments*.

## Hide and unhide the map comments

To hide a map comment click on the map with the right mouse button on the design of the comment and select the context menu *Hide - Map comment*.

To hide the selected map comments click the right mouse button anywhere on the map and select the context menu *Hide selected - Map comments*.

To unhide all the map comments click the right mouse button anywhere on the map and select the context menu *Unhide all - Map comments*.

# GPX data

## What are the GPX data

The acronym GPX stands for GPs eXchange format. It is a type of XML data format designed for the interchange of GPS data between applications and web services on the Internet.

In turn XML stands for eXtensible Markup Language. It is a markup meta language, which is a marker extensible language because it lets you to create custom tags.

The GPS data, representable in GPX format, are:

- Waypoints
- Routes
- Tracks

More information about the GPX format can be found on page http://www.topografix.com/GPX_for_developers.asp.

More information about XML can be found on page http://www.w3.org/XML.

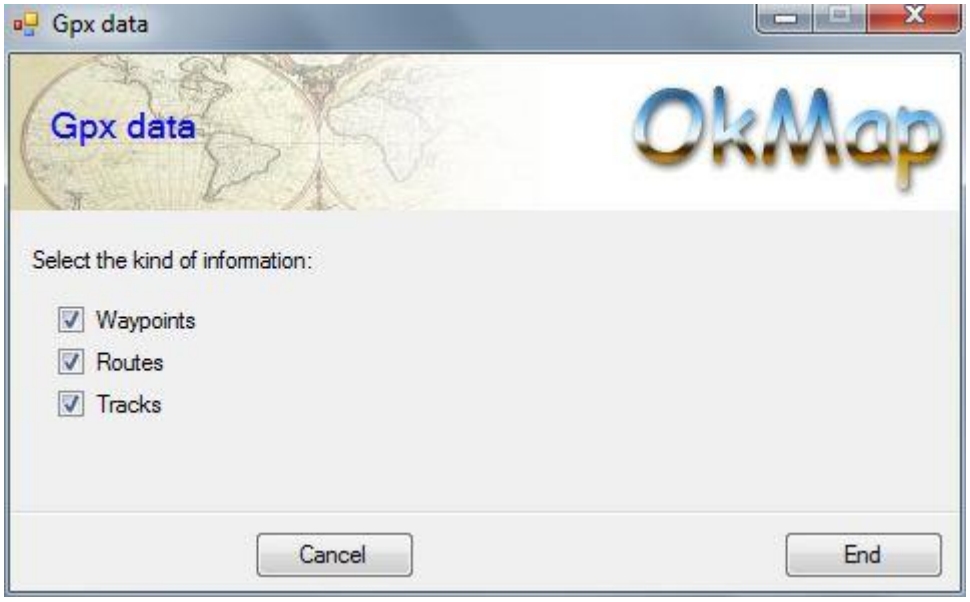
## Load GPX data

To load a data file in GPX format use the menu *File - Load - GPX data (multi)*; it is opened a dialogue box that let you to open one or more file with extension .GPX.

Alternatively, using the combo box of file types, you can upload files in the following formats:

- CompeGPS
- EasyGPS waypoints
- Fugawi waypoints
- Garmin MapSource gdb
- Garmin MapSource mps
- Garmin POI database
- Garmin POI gpi
- Geocaching waypoints
- Google Earth Kml
- Google Earth Kmz
- GPS TrackMaker
- Open StreetMap
- OziExplorer waypoints
- OziExplorer routes
- OziExplorer tracks

When the selection of the files is done, the following window is displayed.




In this window it is possible to specify which types of GPX data you intends to load:

- Waypoints
- Routes
- Tracks

The *End* button acquires the information and loads the data. The *Cancel* button cancel the data import.

## Save GPX data

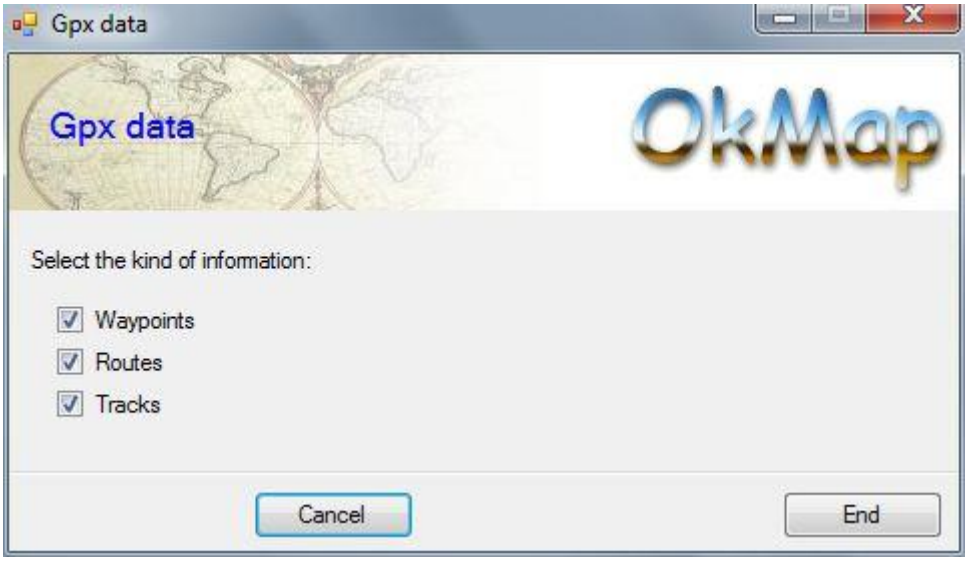
After having created or modified the GPX data, they can be saved through the menu *File - Save - GPX data*; it will be asked a file name with extension .GPX.

Alternatively, using the combo box of file types, you can save data in the following formats:

- CompeGPS
- EasyGPS waypoints
- Fugawi waypoints
- Garmin MapSource gdb
- Garmin MapSource mps
- Garmin POI database
- Garmin POI gpi
- Geocaching waypoints
- Google Earth Kml
- Google Earth Kmz
- GPS TrackMaker
- Open StreetMap
- OziExplorer (wpt,rte,plt)

By default the last .GPX file opened is proposed.

After the selection of the files, the following window is displayed.




In this window it is possible to specify which types of GPX data you want to save:

- Waypoints
- Routes
- Tracks

# Waypoints

## What are the waypoints

Waypoint is a term with which you define the point toward which a boat makes rout. Actually it could be any point where you know the geographic coordinates and possibly other information.

A waypoint can also be designed with OkMap, transferred to a GPS device and used as a reference point, during the navigation.

Special case of the waypoints are POI (Point Of Interest); they are points of particular interest such as museums, hotels, restaurants, gas stations, etc..

The terminology used by OkMap always makes use of the term waypoint.
The waypoint properties managed in OkMap are:

- Waypoint name
- Comment on waypoint
- Description of the waypoint
- Origin of the waypoint
- Link (URL) to additional information on the waypoint
- Symbol to be used (default list)
- Waypoint type
- Altitude above sea level
- Date-time
- Geographical coordinates
- Visible or hidden
- Label visible or hidden
- Bitmap to draw on the map
- Font labels

## Create a waypoint

A waypoint can be created:

- by opening a GPX file created by OkMap or by another application
- by an importation function from a different format (OziExplorer, KML)
- from the receipt of data in a GPS device
- by saving the current position during navigation
- by saving after a conversion or a calculation
- drawing directly on the map

To create it on the map select the appropriate tool with the menu *Tools* - *New waypoint* and click with the left mouse button on the map in the desired position.

Subsequently, through the modify function, you can specify the properties of the new waypoint.

## List the waypoints

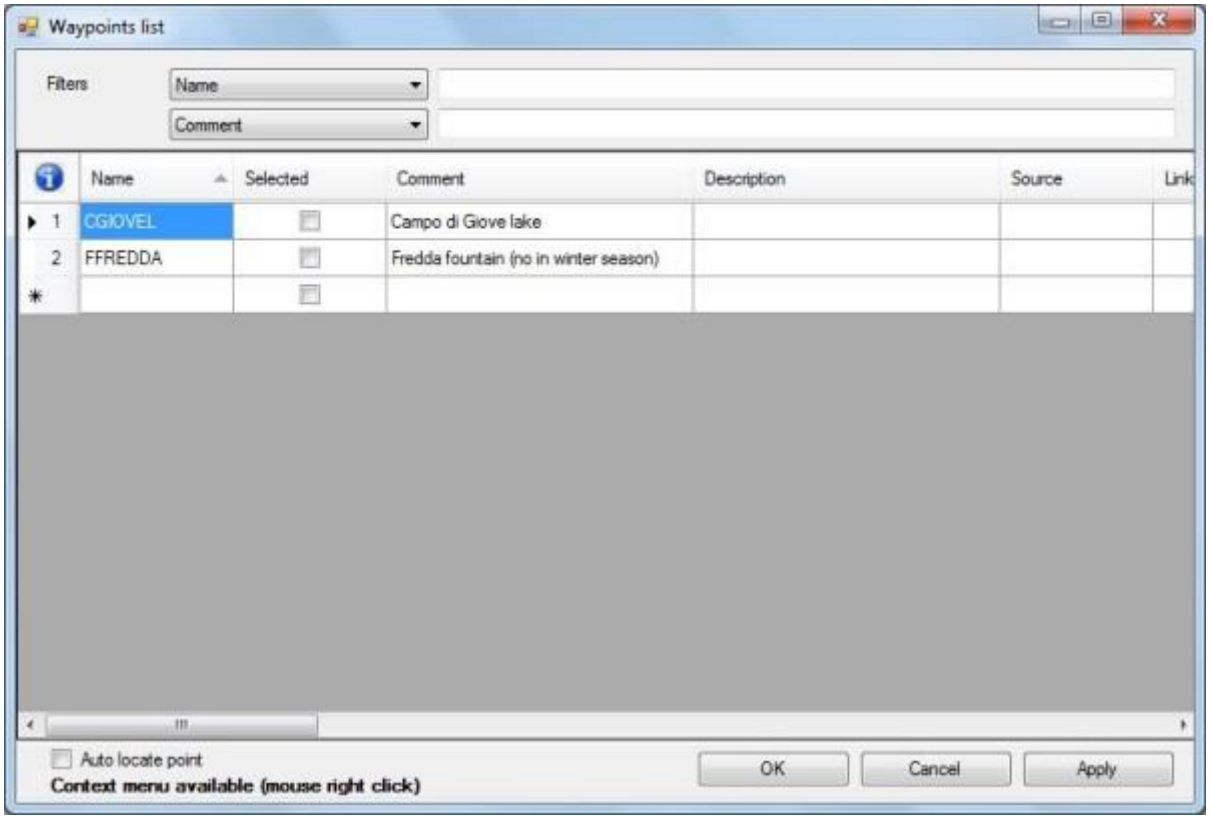
It is a function that can produce a list of waypoints and their characteristics.

Through this function you can change the properties of waypoints and delete one or more waypoints.

You can also select or less a waypoint changing the value contained in the *Selected* column; select a set of waypoints allows to make group operations such as deleting of multiple items.

The information displayed in this window are:

- Waypoint name
- Selected (Yes / No)
- Comment on waypoint
- Description of the waypoint
- Origin of the waypoint
- Link (URL) to additional information on the waypoint
- Symbol to be used (default list)
- Waypoint type
- Geographical coordinates
- Altitude above sea level
- Date-time
- Visible or hidden
- Label visible or hidden
- Bitmap to draw on the map
- Font labels
- Distance (not editable)
- Azimuth (not editable)




To activate this function use the menu *List* - *Waypoint*.

Where you see a blue icon with a down arrow means that has been arranged a function for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Symbol*: opens a window with a table containing the list of available symbols, to select one, simply select the row and press the *OK* button or double click with the left mouse button. The *Find* box, at the top, facilitates the search for the desired symbol.

- *Longitude / Latitude*: it opens a window for easy entry of coordinates; their mode of representation can be chosen selecting:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes

- GMS - coordinates expressed in degrees, minutes and decimal seconds
- UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
- Rad - expressed in decimal radiant

- *Bitmap position*: opens a dialog box for choosing the bitmap file to be used for the representation of the waypoint.

- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the waypoint.

To delete the waypoints see the topic Data tables.

It is also available a context menu activated with the right mouse button. This menu provides the following functions:

- *Copy coordinates*: copy the coordinates of the current waypoint to the clipboard.
- *Find on opened map*: to locate the waypoint on all the opened maps

- *Calculate distances*: calculate, for all the waypoints of the list, the distance from current waypoint and the direction of a virtual line joining the two waypoints.

- *Set DEM altitude*: sets the altitude of the current waypoint using the DEM data available locally. A message may indicate the unavailability of altimetric data.

- *Set DEM altitude for selected*: sets the altitude of all selected waypoints using the DEM data available locally. A message may indicate the unavailability of altimetric data.

- *Reset position bitmap*: cancel the choice of a bitmap made earlier and restores the use of the bitmap defined at global level in the function Preferences - Waypoint.

- *Reset font labels*: cancel the choice of a font made earlier and restores the use of the font defined at global level in the function Preferences - Waypoint.

- *Default grid layout*: restores the default size of the grid columns.

When "Auto locate point" is checked, when you make click on a waypoint, this will be located on all the opened maps.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

For more information about the general use of tables, see the topic Data tables.

## Select the waypoints

Select a set of waypoints allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the waypoints you can use one of the following methods:

- Use the List-Waypoints function and activate the check in the table in the *selected* column in the row corresponding to the waypoint to be selected.

- Click on the map with the left mouse button on the corresponding icon.

- In case of overlapping objects, click the right mouse button to select the waypoint and use the context menu *Select - waypoint*.

- To add other waypoints to the selection hold down the *Ctrl* key and click on the icons of the waypoint you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the *Shift* key and left mouse button.
- To add a group of neighboring GPX objects hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a waypoint

To obtain information about a waypoint is sufficient, if activated autoinfo (menu *View* - *Auto info*), place the mouse on its design.

A panel containing the following information is displayed:

- the waypoint name
- the comment on the waypoint
- the description of the waypoint
- the geographical coordinates
- the altitude above sea level

In any case, you can click the right mouse button on the waypoint icon and select the context menu *Info* - *waypoint*.

A window containing the following information will be opened:

- the waypoint name
- the comment on the waypoint
- the description of the waypoint
- the geographical coordinates
- the altitude above sea level
- link (URL) to additional information on the waypoint

This window will automatically close when you click on another point on the map.

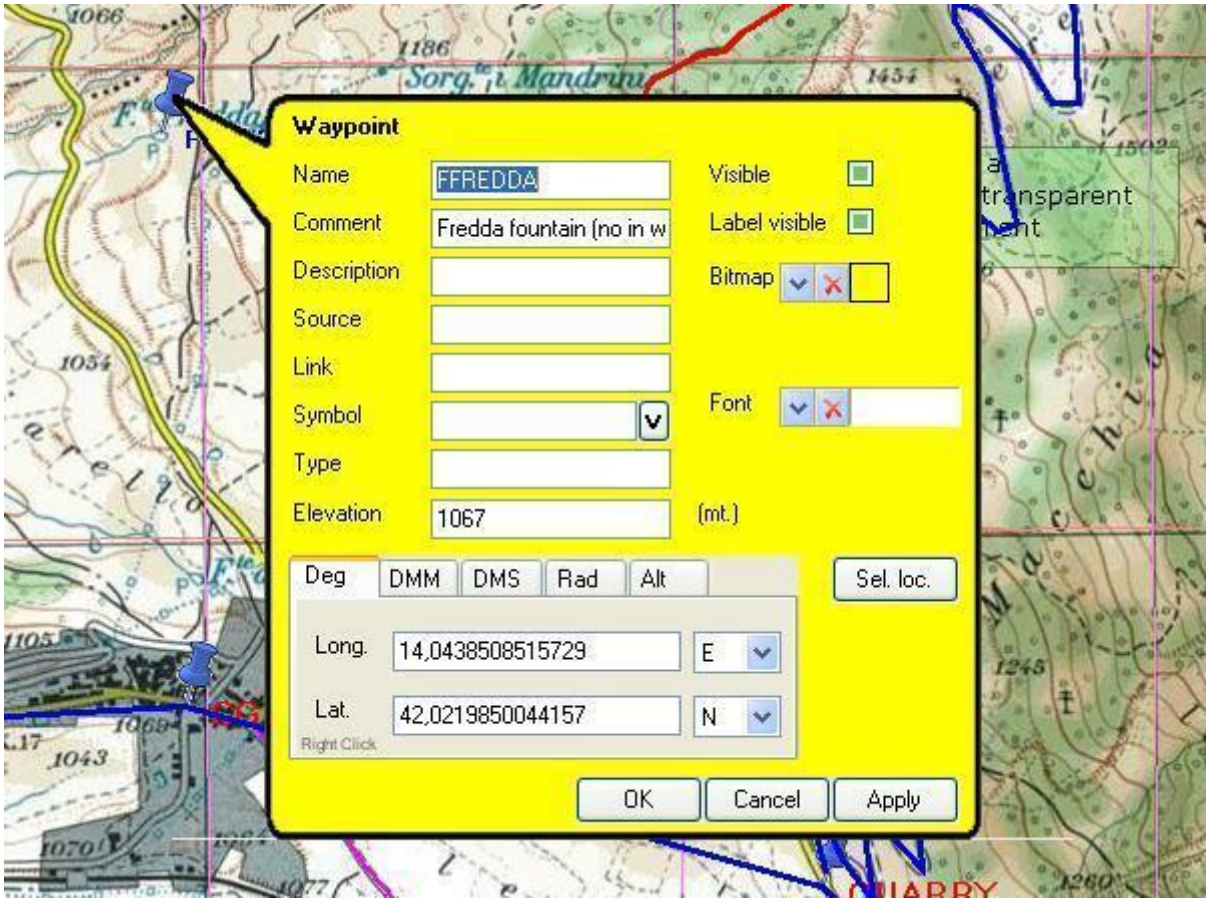
## Modify the waypoints

You can modify the properties of a waypoint with the function List Waypoints.

Alternatively you can click the right mouse button on the waypoint icon and select the context menu *Modify - waypoint*.

A window containing the following information is opened:

- Waypoint name
- Comment on the waypoint
- Description of the waypoint
- Origin of the waypoint
- Link (URL) to additional information on the waypoint
- Symbol to use (default list)
- Waypoint type
- Altitude above sea level
- Date-time
- Geographical coordinates
- Visible or hidden
- Label visible or hidden
- Bitmap to draw on the map
- Font labels




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Symbol*: opens a window with a table containing the list of available symbols; to choose one, simply select the row and press the *Ok* button or double click with the left mouse button. The *Find* field, located above, facilitates the search for the desired symbol.

- *Bitmap*: opens a dialog box for choosing the image file to be used for the representation of the waypoint.

- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the waypoints.

Where appears an icon with a cross (*Bitmap* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function Preferences - Waypoints.

While entering the coordinates can be chosen their mode of representation, selecting:

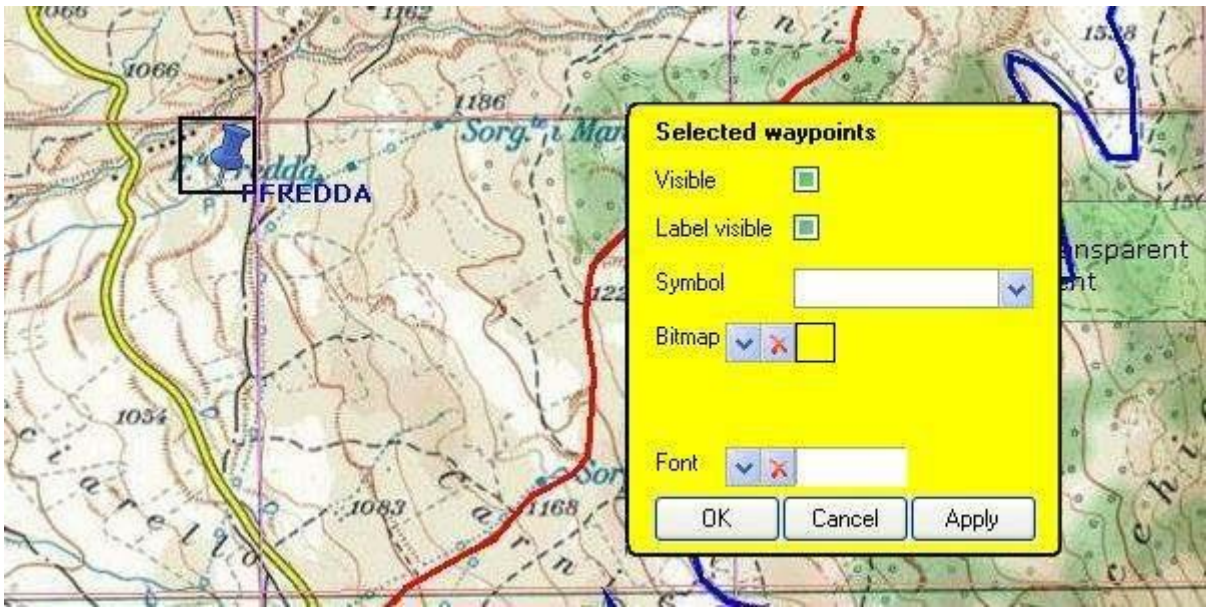
- Degrees - coordinates expressed in decimal degrees
- GMM - coordinates expressed in degrees and decimal minutes
- GMS - coordinates expressed in degrees, minutes and decimal seconds
- UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
- Rad - expressed in decimal radiant

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

To modify all the selected waypoints click the right mouse button anywhere on the map and select the context menu *Modify selected - Waypoints*.

A window containing the following information common to multiple waypoints is opened:

- Visible or hidden
- Label visible or hidden
- Bitmap to be drawn on the map
- Font labels

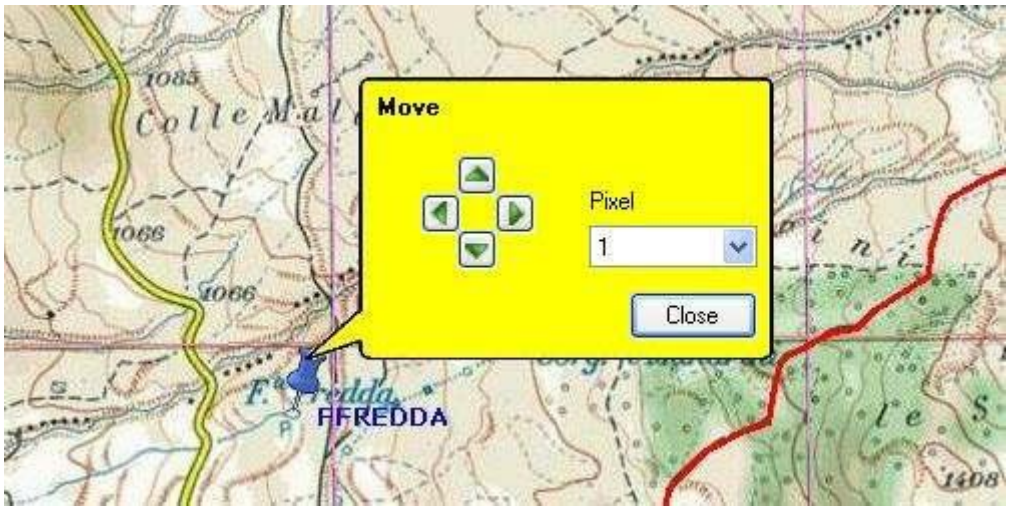



Apply the same considerations to editing a waypoint.

## Move a waypoint

To move a waypoint click with the right mouse button on the on the icon of the waypoint and to select the context menu *Move - waypoint*.

A window is opened with four arrows buttons.




Press the buttons to move the waypoint in the desired direction.
The movement is made of how many pixels are shown in the near combo box.

Alternatively you can click the left mouse button on the object to move, hold and move the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the waypoints

You can delete a waypoint with the function List - Waypoints.

Alternatively you can click the right mouse button on the waypoint icon and select the context menu *Delete - waypoint*.

To delete the selected waypoints, click the right mouse button anywhere on the map and select the context menu *Delete selected - Waypoints*.

To delete all waypoints, click the button right-click anywhere on the map and select the context menu *Delete all - Waypoints*.

In addition, to delete all data GPX click the right mouse button anywhere on the map and select the context menu *Delete all – GPX data*.

Finally, to erase all GPX and vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - All*.

## Hide and unhide the waypoints

You can hide a waypoint with the function List - Waypoints.

Alternatively, to hide a waypoint click with the right mouse button on the icon of the waypoint and select the context menu *Hide - waypoint*.

To hide the selected waypoints make click the right mouse button anywhere on the map and select the context menu *Hide selected - Waypoints*.

To unhide all the waypoints click the right mouse button anywhere on the map and select the context menu *Unhide all - Waypoints*.

## Set the altitude to a waypoint

You can attribute the altitude to a waypoint using the DEM data available locally with the function List - Waypoint, using the context menu *Set DEM altitude*.

Alternatively you can click the right mouse button on the waypoint icon and select the context menu *Set DEM altitude - waypoint*. A message indicates the unavailability of the altimetric data.

## Navigate toward a waypoint

This function is used to obtain indications about the direction to follow for reaching a waypoint; naturally assumes the use of a connected GPS device.

To navigate toward a waypoint, click the right mouse button on the waypoint icon and select the context menu *Navigate - waypoint*.

OkMap does the following:

- Activates the navigation mode
- Opens the window navigation data
- Opens the window navigate toward a waypoint

For the use of the single functions, see the relative pages.

# Routes

## What are the routes

The route is a set of Waypoint in sequence, such a pathway. This path is typically a nautical route in which each waypoint indicates a change of direction or a road in which each waypoint indicates a ramification (intersection, alternative, rotunda, exit, etc..).

A route can also be designed with OkMap, transferred to a GPS and used for getting information, during the navigation, in proximity of the waypoints (change of route).
The properties of a route managed in OkMap are:

- Route name
- Comment on the route
- Description of the route
- Origin of the route
- Link (URL) to additional information on the route
- Route type
- Visible or hidden
- Label visible or hidden
- Color to use in drawing on the map
- Line thickness
- Font labels
- A list of waypoints defining the route, with the following properties:
  - Relative position of the waypoint
  - Waypoint name
  - Selected (Yes / No)
  - Comment on the waypoint
  - Description of the waypoint
  - Origin of the waypoint
  - Link (URL) to additional information on the waypoint
  - Symbol to be used
  - Waypoint type
  - Geographical coordinates
  - Altitude above sea level
  - Date-time
  - Visible or hidden
  - Label visible or hidden
  - Bitmap to draw on the map
  - Font labels

## Create a route

A route can be created:

- by opening a GPX file created by OkMap or by another application
- by an importation function from a different format (OziExplorer, KML)
- from the receipt of data in a GPS device
- drawing directly on the map

To create it on the map select the appropriate tool with the menu *Tools - New route waypoint* and click with the left mouse button on the map in the position of the first waypoint.

Then using the same technique you can create the next waypoint in sequence. Finally, using the modify function, you can specify the properties of the new route.

To create an additional route use the List routes function, enter the new route and *selected* it by activating the indicator. Before drawing the waypoint, make sure that the just

inserted route is the only one selected because the waypoints will be added to the first selected route.

## List the routes

It is a function that can produce a list of routes and their characteristics.

Moving the cursor on the single routes, all the relative waypoints are displayed in the second table.

Through this function you can change the properties of the routes, the properties of the waypoints and delete one or more routes or one or more waypoints.

You can also select or less the routes or the waypoints changing the value contained in the *Selected* column; select a set of routes or waypoints allows to make group operations such as deleting of multiple items.

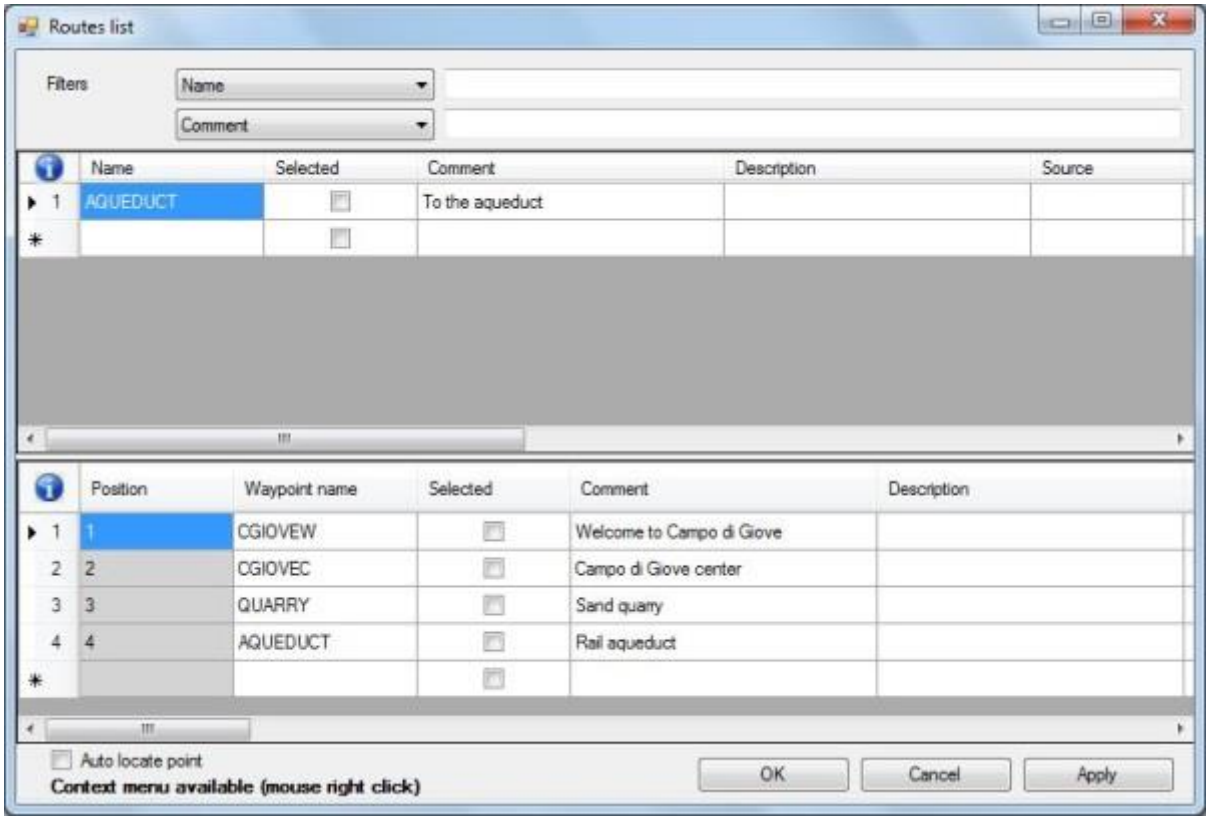
You can add a new route (with no waypoints) ready to be drawn with the mouse on the map (selected it first).

This window shows two tables: routes and waypoints.
The first table (routes) contains the following information:

- Route name
- Selected (Yes / No)
- Comment on the route
- Description of the route
- Origin of the route
- Link (URL) to additional information on the route
- Symbol to be used (default list)
- Route type
- Visible or hidden
- Label visible or hidden
- Color to use in drawing on the map
- Line thickness
- Font labels
- Number of waypoints in the route (not editable)

The second table (waypoints) contains the following information:

- Relative position of the waypoint (not editable)
- Name of the waypoint (not editable)
- Selected (Yes / No)
- Comment on the waypoint
- Description of the waypoint
- Origin of the waypoint
- Link (URL) to additional information on the waypoint
- Symbol to be used (default list)
- Waypoint type
- Geographical coordinates
- Altitude above sea level
- Date-time
- Visible or hidden
- Label visible or hidden
- Bitmap to draw on the map
- Font labels
- Distance from the previous waypoint (not editable)
- Distance from the beginning of the route (not editable)
- Azimuth to the next waypoint (not editable)




To activate this function use the menu *List - Routes*.

Where you see a blue icon with a down arrow means that has been arranged a function for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Color*: opens a dialog box for choosing the color to use in drawing lines between the waypoints.
- *Thickness line*: opens a dropdown for selecting the thickness of the lines between waypoints.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the route.
- *Symbol*: opens a window with a table containing the list of available symbols, to select one, simply select the row and press the OK button or double click with the left mouse button. The Find box, at the top, facilitates the search for the desired symbol.
- *Longitude / Latitude*: it opens a window for easy entry of coordinates; their mode of representation can be chosen selecting:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant
- *Bitmap position*: opens a dialog box for choosing the bitmap file to be used for the representation of the waypoint.

To insert the routes or to delete the routes or the waypoints see the topic Data tables.

It is also available a context menu activated with the right mouse button. In the first table (routes) this menu provides the following functions:

- *Set DEM altitude*: sets the altitude of the waypoints of the current route using the DEM data available locally. A message may indicate the unavailability of altimetric data.

- *Set DEM altitude for selected*: sets the altitude of all waypoints of the selected routes using the DEM data available locally. A message may indicate the unavailability of altimetric data.

- *Reset color*: cancels selection of the line color made earlier and restores the use of the color defined at global level in the function Preferences - Routes.

- *Reset font labels*: cancel the choice of a font made earlier and restores the use of the font defined at global level in the function Preferences - Routes.

- *Duplicate route*: create a new route with the same waypoints of the current route. The name of the new route will be equal to the name of the origin route preceded by "C".

- *Invert route*: create a new route with the same waypoints of the current route but in inverse sequence. The name of the new route will be equal to the name of the origin route preceded by "I".

- *Add to Join route*: add all the waypoints contained in the current route in the route named "JOIN". If the route JOIN does not exist it is automatically created with the same characteristics as the current route.

- *Default grid layout*: restores the default size of the grid columns.

In the second table (waypoints) the context menu provides the following functions:

- *Copy coordinates*: copy the coordinates of the current waypoint to the clipboard.
- 
- *Find on opened map*: to locate the waypoint on all the opened maps

- *Set DEM altitude*: sets the altitude of the current waypoint using the DEM data available locally. A message may indicate the unavailability of altimetric data.

- *Set DEM altitude for selected*: sets the altitude of all selected waypoints using the DEM data available locally. A message may indicate the unavailability of altimetric data.

- *Moves down*: moves the current waypoint after the next waypoint (if the current waypoint is not the last).

- *Move up*: moves the current waypoint before the previous waypoint (if the current waypoint is not the first).

- *Reset position bitmap*: cancel the choice of a bitmap made earlier and restores the use of the bitmap defined at global level in the function Preferences - Waypoint.

- *Reset font labels*: cancel the choice of a font made earlier and restores the use of the font defined at global level in the function Preferences - Waypoint.

- *Default grid layout*: restores the default size of the grid columns.

When “Auto locate point” is checked, when you make click on a route waypoint, this will be located on all the opened maps.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.

To exit without saving the data, press the *Cancel* button.

For more information about the general use of tables, see the topic Data tables.

## Select the routes

Select a single route is useful when you want to add waypoints to the end.

Select a set of routes allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the routes you can use one of the following methods:

- Use the List routes function and activate the check in the table in the selected column in the row corresponding to the route to be selected.
- Click on the map with the left mouse button anywhere on the line connecting the waypoints.
- In case of overlapping objects, click the right mouse anywhere on the line connecting the waypoints and use the context menu Select - route.
- To add other routes to the selection hold down the Ctrl key and click on the line of the route you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the Shift key and left mouse button.
- To add a group of neighboring GPX objects hold down the Ctrl and Shift keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, Invert selection.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Select the route waypoints

Select a single route waypoint is useful when you want to add waypoints in the route, particularly before the selected waypoint.

Select a set of route waypoints allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the route waypoints you can use one of the following methods:

- Use the List routes function and activate the check in the second table in the *selected* column in the row corresponding to the waypoint to be selected. Click on the map with the left mouse button on the corresponding icon.
- In case of overlapping objects, click the right mouse on the waypoint and use the context menu Select - route waypoint.
- To add other route waypoints to the selection hold down the Ctrl key and click on waypoint icon you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the Shift key and left mouse button.

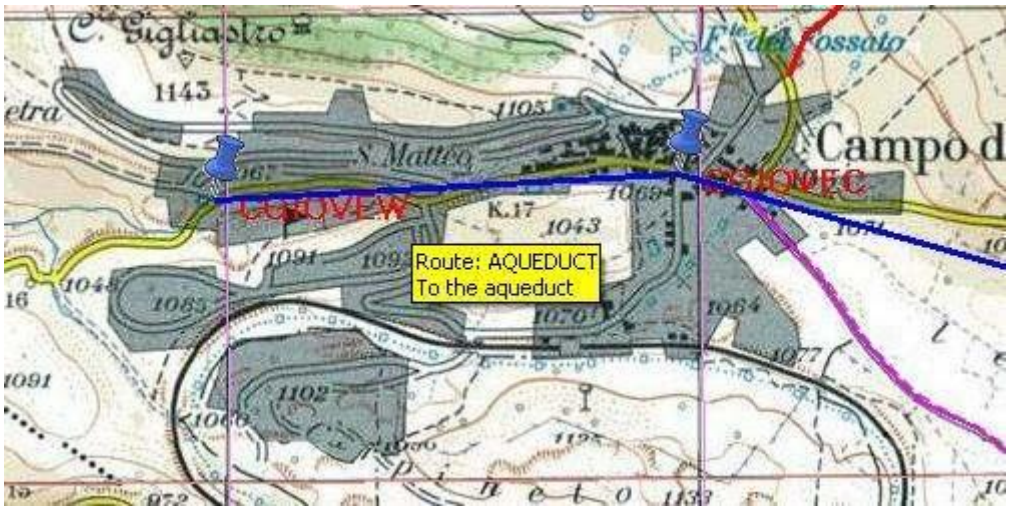
- To add a group of neighboring GPX objects hold down the Ctrl and Shift keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, Invert selection.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a route

To obtain information about a route is sufficient, if activated autoinfo (menu *View* - *Auto info*), place the mouse on the line joining two waypoints of the route.

A panel containing the following information is displayed:

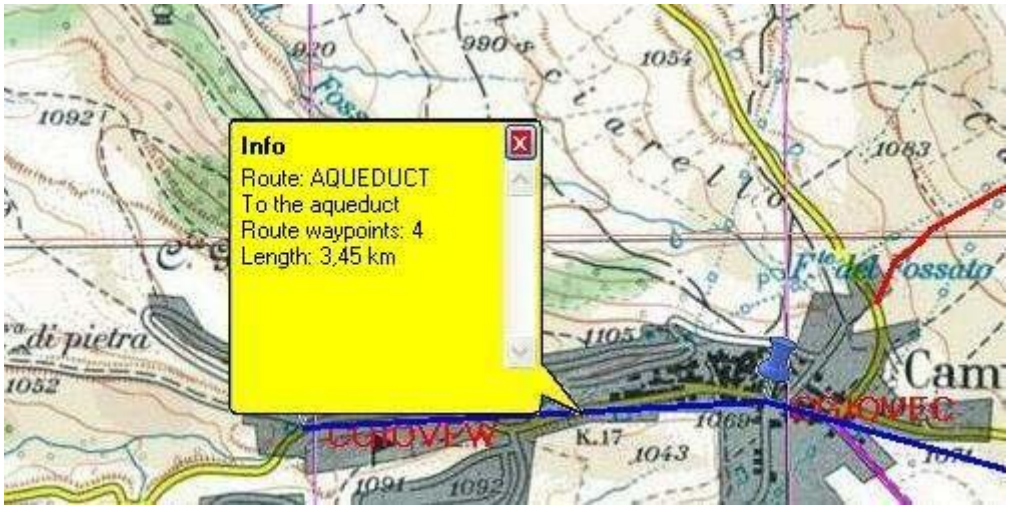
- the route name
- the comment on the route
- the description of the route




In any case, you can click the right mouse button on the waypoint icon and select the context menu *Info* - *route*.

A window containing the following information will be opened:

- the route name
- the comment on the route
- the description of the route
- the number of waypoints
- the route length
- link (URL) to additional information on the route



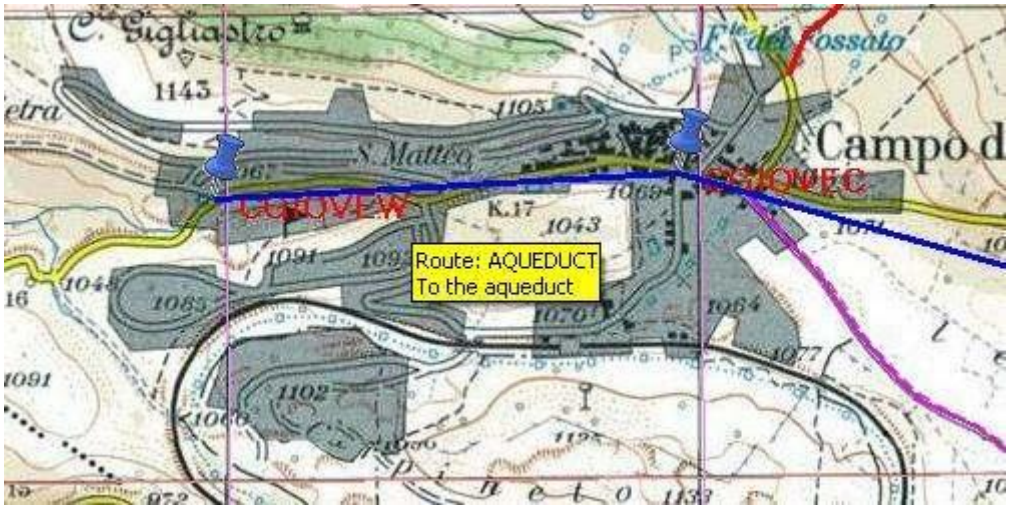

This window will automatically close when you click on another point on the map.

## Information about a route waypoint

To obtain information about a route waypoint is sufficient, if activated autoinfo (menu *View - Auto info*), place the mouse on the route waypoint.

A panel containing the following information is displayed:

- the route name
- the waypoint number
- the waypoint name
- the comment on the waypoint
- the waypoint description
- the geographical coordinates
- the altitude above sea level




In any case, you can click the right mouse button on the route waypoint icon and select the context menu *Info - route waypoint*.

A window containing the following information will be opened:

- the route name
- the waypoint number
- the waypoint name
- the comment on the waypoint
- the waypoint description
- the geographical coordinates

- the altitude above sea level
- link (URL) to additional information on the route

This window will automatically close when you click on another point on the map.

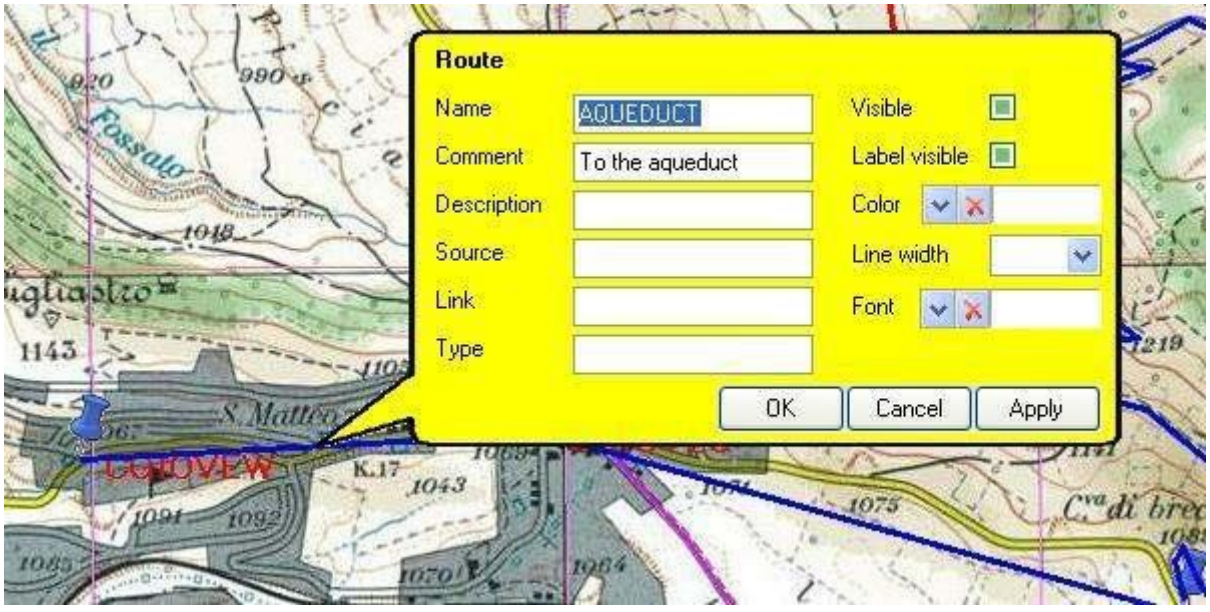
## Modify the routes

You can modify the properties of a route with the function List routes.

Alternatively you can click the right mouse button on the line joining two waypoints of the route and select the context menu *Modify - route*.

A window containing the following information is opened:

- Route name
- Comment on the route
- Description of the route
- Origin of the route
- Link (URL) to additional information on the route
- Route type
- Visible or hidden
- Label visible or hidden
- Color to use in drawing on the map
- Line thickness
- Font labels



Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

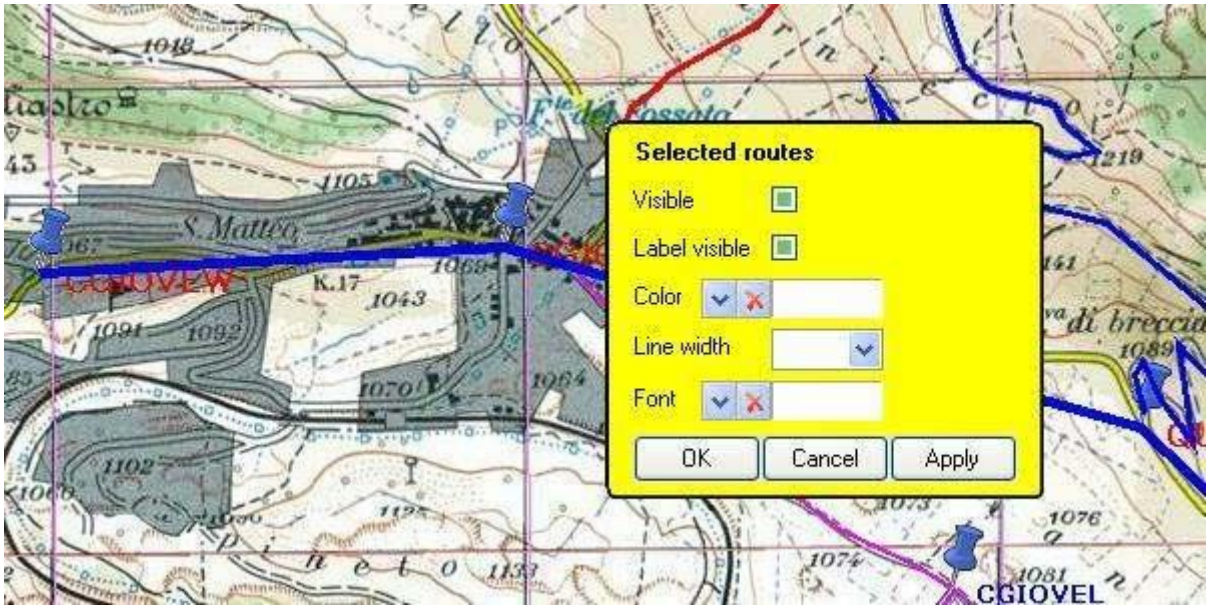
- *Color*: opens a dialog box for choosing the color to use in drawing lines between the waypoints.
- *Thickness line*: opens a dropdown for selecting the thickness of the lines between waypoints.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the route.

Where appears an icon with a cross (*Color* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function Preferences - Routes.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

To modify all the selected routes click the right mouse button anywhere on the map and select the context menu *Modify selected - Routes*.
A window containing the following information common to multiple routes is opened:

- Visible or hidden
- Label visible or hidden
- Color to use in drawing on the map
- Line thickness
- Font labels




Apply the same considerations to editing a route.

## Add a waypoint to a route

To add a waypoint at the end of a route, select the route, then select the appropriate tool with the menu *Tools - New route waypoint* and then click the left mouse button on the map in relative position to the waypoint you want to add.

To add a waypoint in a route, select the waypoint previous to that you want to insert, then proceed as above.

## Delete a waypoint from a route

You can delete a route waypoint with the function List routes.

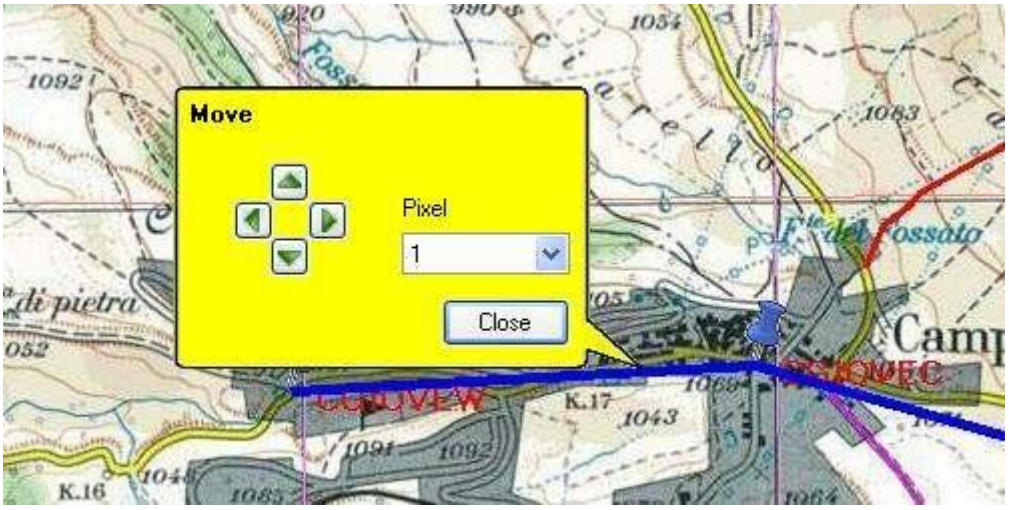
Alternatively you can click the right mouse button on the route waypoint icon and select the context menu *Delete - route waypoint*.

If this is the last entered waypoint, you can select the route and choose the context menu *Delete last point - route*.

## Move a route

To move a route click with the right mouse button anywhere on the line connecting the waypoints and to select the context menu *Move - route*.

A window is opened with four arrows buttons.




Press the buttons to move the waypoint in the desired direction.

The movement is made of how many pixels are shown in the near combo box.

Alternatively you can click the left mouse button on the object to move, hold and move the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the routes

You can delete a route with the function List routes.

Alternatively you can click the right mouse button anywhere on the line connecting the waypoints and select the context menu *Delete - route*.

To delete the selected routes, click the right mouse button anywhere on the map and select the context menu *Delete selected - Routes*.

To delete all routes, click the button right-click anywhere on the map and select the context menu *Delete all - Routes*.

In addition, to delete all data GPX click the right mouse button anywhere on the map and select the context menu *Delete all – GPX Data*.

Finally, to erase all GPX and vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - All*.

## Hide and unhide the routes

You can hide a route with the function List routes.

In alternative it is possible to make click with the right key of the mouse anywhere on the line connecting the waypoints and select the context menu *Hide - route*.

To hide the selected routes make click the right mouse button anywhere on the map and select the context menu *Hide selected - Routes*.

To unhide all the routes click the right mouse button anywhere on the map and select the context menu *Unhide all - Routes*.

## Duplicate a route

You can duplicate a route with the function List routes, using the context menu *Duplicate route*.

Alternatively you can click the right mouse button anywhere on the line connecting the route waypoints and select the context menu *Duplicate - route*.

Create a new route with the same waypoints of the indicated route. The name of the new route will be equal to the name of the origin route preceded by "C.".

## Invert a route

You can reverse a route with the function List routes, using the context menu *Invert route*.

Alternatively you can click the right mouse button anywhere on the line connecting the route waypoints and select the context menu *Invert - route*.

Create a new route with the same waypoints of the indicated route, but in inverse sequence. The name of the new route will be equal to the name of the origin route preceded by "I.".

## Join the routes

You can add all the route waypoints in a route named JOIN with the function List routes, using the context menu *Add to the Join route*.

Alternatively you can click the right mouse button anywhere on the line connecting the route waypoints and select the context menu *Add to Join - route*.

All the route waypoints are added in the route named "JOIN." If the route JOIN does not exist it is automatically created with the same characteristics as the current route.

## Set the altitude to a route

You can set the altitude of the waypoints of the a route using the DEM data available locally, with the function List routes, using the context menu *Set DEM altitude*.

Alternatively you can click the right mouse button anywhere on the line connecting the route waypoints and select the context menu *Set DEM altitude - route*. A message may indicate the possible unavailability of the altimetric data.

If you want set the altitude on only one waypoint of the route, select the route, then click the right mouse button on the waypoint of the route and select the context menu *Set DEM altitude – route waypoint*.

## Navigate along a route

This function is used to obtain indications about the direction to navigate along a route; naturally assumes the use of a connected GPS device.

To navigate along a route, click the right mouse button anywhere on the line connecting the route waypoints and select the context menu *Navigate - route*.

OkMap does the following:

- Activates the navigation mode
- Opens the window navigation data
- Opens the window navigate along a route

For the use of the single functions, see the relative pages.

# Tracks

## What are the tracks

Track is a set of points in sequence and very close, such a pathway. This path can be of any nature (road, path, etc. ..) and is usually detected by GPS on the go.

A track can also be designed with OkMap, transferred and used by a GPS during the travel, to follow the path accurately.

The properties of a track managed in OkMap are:

- Track name
- Comment on the track
- Description of the track
- Origin of the track
- Link (URL) to additional information on the track
- Track type
- Visible or hidden
- Label visible or hidden
- Last position visible or hidden
- Color to use in drawing on the map
- Line thickness
- Font labels
- A list of points defining the track, with the following properties:
  - Number of the segment to which the point belongs
  - Relative position of the point in the segment
  - Selected (Yes / No)
  - Geographical coordinates
  - Altitude above sea level
  - Date/time of point detection

## Create a track

A track can be created:

- by opening a GPX file created by OkMap or by another application
- by an importation function from a different format (OziExplorer, KML)
- from the receipt of data in a GPS device
- by recording during the navigation with the GPS
- drawing directly on the map

To create it on the map select the appropriate tool with the menu *Tools - New track point* and click with the left mouse button on the map in the position of the first point.
Then using the same technique you can create the next point in sequence. Finally, using the modify, you can specify the properties of the new track.

To create an additional track use the List tracks function, enter the new track and *selected* it by activating the indicator. Before drawing the point, make sure that the just inserted track is the only one selected because the points will be added to the first selected track.

## List the tracks

It is a function that can produce a list of tracks and their characteristics.

Moving the cursor on the single tracks, all the relative points are displayed in the second table.

Through this function you can change the properties of the tracks, the properties of the points and delete one or more tracks or one or more points.

You can also select or less the tracks or the points changing the value contained in the *Selected* column; select a set of tracks or points allows to make group operations such as deleting of multiple items.

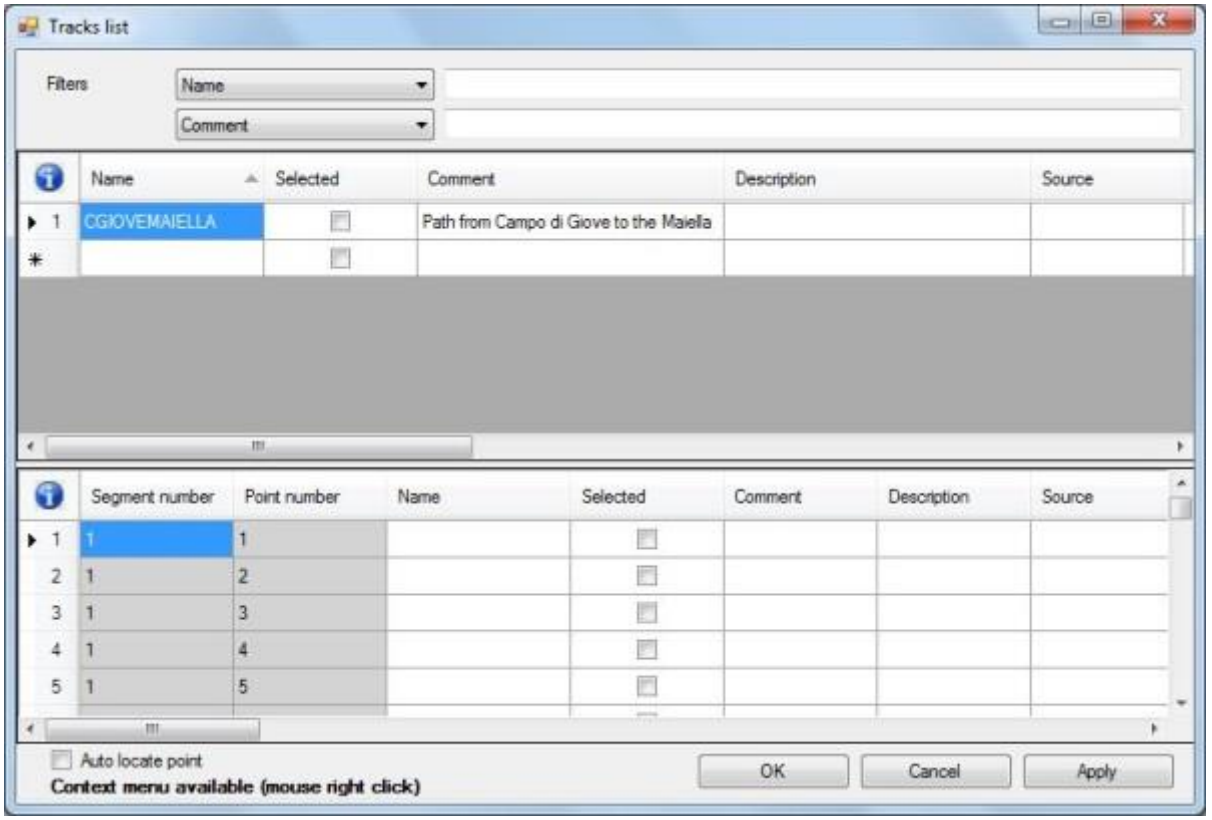
You can add a new track (with no points) ready to be drawn with the mouse on the map (selected it first).

This window shows two tables: tracks and points.
The first table (tracks) contains the following information:

- Track name
- Comment on the track
- Description of the track
- Origin of the track
- Link (URL) to additional information on the track
- Track type
- Visible or hidden
- Label visible or hidden
- Last position visible or hidden
- Proximity circle visible or hidden
- Band visible or hidden
- Bearing line visible or hidden
- Color to use in drawing on the map
- Line thickness
- End position bitmap
- Font labels
- Proximity circle color
- Proximity circle opacity
- Proximity circle width in meters
- Band color
- Band opacity
- Band width in meters
- Bearing line color
- Bearing line thickness
- Number of segments in the track (not editable)
- Number of points in the track (not editable)

The second table (points) contains the following information:

- Number of the segment to which the point belongs (not editable)
- Relative position of the point in the segment (not editable)
- Name of the point
- Selected (Yes / No)
- Geographical coordinates
- Altitude above sea level
- Date/time of point detection
- Instant velocity
- Distance from the previous point (not editable)
- Distance from the beginning of the track (not editable)
- Azimuth toward the following point (not editable)




To activate this function use the menu *List - Tracks*.

Where you see a blue icon with a down arrow means that has been arranged a function for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Color*: opens a dialog box for choosing the color to use in drawing lines between the points.
- *Thickness line*: opens a dropdown for selecting the thickness of the lines between points.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the track.
- *Longitude / Latitude*: it opens a window for easy entry of coordinates; their mode of representation can be chosen selecting:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant

To insert the tracks or to delete the tracks or the points see the topic Data tables.

It is also available a context menu activated with the right mouse button. In the first table (tracks) this menu provides the following functions:

- *Statistics*: displays a window with statistical information
- *Altitude profile*: display a window with a graph of the altitude profile
- *Set DEM altitude*: sets the altitude of the points of the current track using the DEM data available locally. A message may indicate the unavailability of altimetric data.
- *Set DEM altitude for selected*: sets the altitude of all points of the selected tracks

using the DEM data available locally. A message may indicate the unavailability of altimetric data.

- *Set travel time*: estimates the travel time of the points of the current track. The walking speed, flat is defined in the function Preferences - Tracks.
- *Set travel time for selected*: estimates the travel time of all the points of the selected tracks.
- *Reset color*: cancels selection of the line color made earlier and restores the use of the color defined at global level in the function Preferences - Tracks.
- *Reset font labels*: cancel the choice of a font made earlier and restores the use of the font defined at global level in the function Preferences - Tracks.
- *Simplify track*: create a new simplified track with a maximum number of points equal to that defined in the function Preferences - Tracks. The name of the new track will be equal to the name of the origin track preceded from "S.".
- *Duplicate track*: create a new track with the same points of the current track. The name of the new track will be equal to the name of the origin track preceded by "C".
- *Invert track*: create a new track with the same points of the current track but in inverse sequence. The name of the new track will be equal to the name of the origin track preceded by "I".
- *Merge segment*: all segments of the track are merged into a single segment.
- *Add to Join track*: add all the points contained in the current track in the track named "JOIN". If the track JOIN does not exist it is automatically created with the same characteristics as the current track.
- *Default grid layout*: restores the default size of the grid columns.

In the second table (points) the context menu provides the following functions:

- *Copy coordinates*: copy the coordinates of the current point to the clipboard.
- 
- *Find on opened map*: to locate the track point on all the opened maps
- *Set DEM altitude*: sets the altitude of the current point using the DEM data available locally. A message may indicate the unavailability of altimetric data.
- *Set DEM altitude for selected*: sets the altitude of all selected points using the DEM data available locally. A message may indicate the unavailability of altimetric data.
- *New segment*: starting from the current point creates an additional segment breaking, in this way, the current track at that point.
- *Divide track*: creates a new track excluding the points above the current one. The name of the new track will be equal to the name of the origin track preceded by "N".
- *Default grid layout*: restores the default size of the grid columns. To save the modified data press the *Apply* button.

When “Auto locate point” is checked, when you make click on a track point, this will be located on all the opened maps.

To save the changed data and exit function press the *Ok* button.

To exit without saving the data, press the *Cancel* button.

For more information about the general use of tables, see the topic Data tables.

## Select the tracks

Select a single track is useful when you want to add points to the end.

Select a set of tracks allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the tracks you can use one of the following methods:

- Use the List tracks function and activate the check in the table in the *selected* column in the row corresponding to the track to be selected.
- Click on the map with the left mouse button anywhere on the line connecting the points.
- In case of overlapping objects, click the right mouse anywhere on the line connecting the points and use the context menu *Select - track*.
- To add other tracks to the selection hold down the *Ctrl* key and click on the line of the track you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the *Shift* key and left mouse button.
- To add a group of neighboring GPX objects hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Select the track points

Select a single track point is useful when you want to add points in the track, particularly before the selected point.

Select a set of track point allows you to perform group operations such as editing or deleting multiple GPX objects simultaneously.

To select the track points you can use one of the following methods:

- Use the List tracks function and activate the check in the second table in the *selected* column in the row corresponding to the point to be selected.
- Click on the map with the left mouse button on the corresponding little ball. In case of overlapping objects, click the right mouse on the point and use the context menu *Select - track point*.
- To add other track points to the selection hold down the *Ctrl* key and click on the point you want to add.
- To select a group of neighboring GPX objects, draw a rectangle by holding down the *Shift* key and left mouse button.

- To add a group of neighboring GPX objects hold down the *Ctrl* and *Shift* keys and draw a rectangle as in the previous case.
- You can reverse the selection of objects using the context menu, activated with the right mouse button, *Invert selection*.
- To deselect all the objects click anywhere on the map where there aren't objects.

## Information about a track

To obtain information about a track is sufficient, if activated autoinfo (menu *View - Auto info*), place the mouse on the line joining two points of the route.

A panel containing the following information is displayed:

- the track name
- the comment on the track
- the description of the track

In any case, you can click the right mouse button anywhere on the line joining two point and select the context menu *Info - track*.

A window containing the following information will be opened:

- the track name
- the comment on the track
- the description of the track
- the number of the segments
- the number of the points
- the track length
- link (URL) to additional information on the route

This window will automatically close when you click on another point on the map.

## Information about a track point

To obtain information about a track point is sufficient, if activated autoinfo (menu *View - Auto info*), place the mouse on the track point.

A panel containing the following information is displayed:

- the track name
- the segment number
- the point number
- the comment
- the description
- the geographical coordinates
- the altitude above sea level
- the date/time of point detection

In any case, you can click the right mouse button on the track point and select the context menu *Info - track point*.

A window containing the following information will be opened:

- the track name
- the segment number
- the point number
- the comment
- the description

- the geographical coordinates
- the altitude above sea level
- the date/time of point detection
- instant velocity

This window will automatically close when you click on another point on the map.

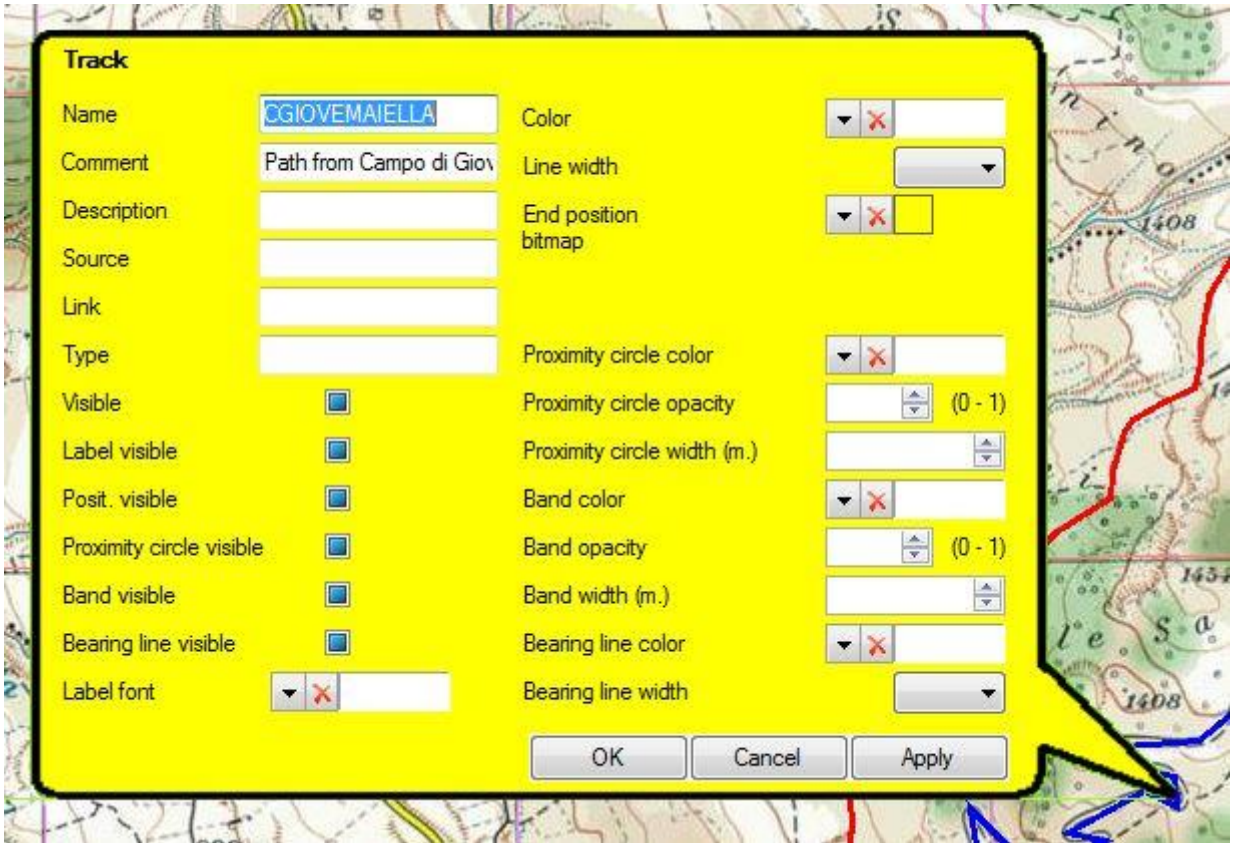
## Modify the tracks

You can modify the properties of a track with the function List tracks.

Alternatively you can click the right mouse button on the line joining two points of the track and select the context menu *Modify - track*.

A window containing the following information is opened:

- Track name
- Comment on the track
- Description of the track
- Origin of the track
- Link (URL) to additional information on the track
- Track type
- Visible or hidden
- Label visible or hidden
- Last position visible or hidden
- Proximity circle visible or hidden
- Band visible or hidden
- Bearing line visible or hidden
- Font labels
- Color to use in drawing on the map
- Line thickness
- End position bitmap
- Proximity circle color
- Proximity circle opacity
- Proximity circle width in meters
- Band color
- Band opacity
- Band width in meters
- Bearing line color
- Bearing line width




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Color*: opens a dialog box for choosing the color to use in drawing lines between the points.
- *Thickness line*: opens a dropdown for selecting the thickness of the lines between points.
- *Font labels*: opens a dialog box for choosing the font to use for the representation of the labels of the track.

Where appears an icon with a cross (*Color* and *Font*) means that you want to delete the choice made previously, and restore the default specified in the function Preferences - Tracks.

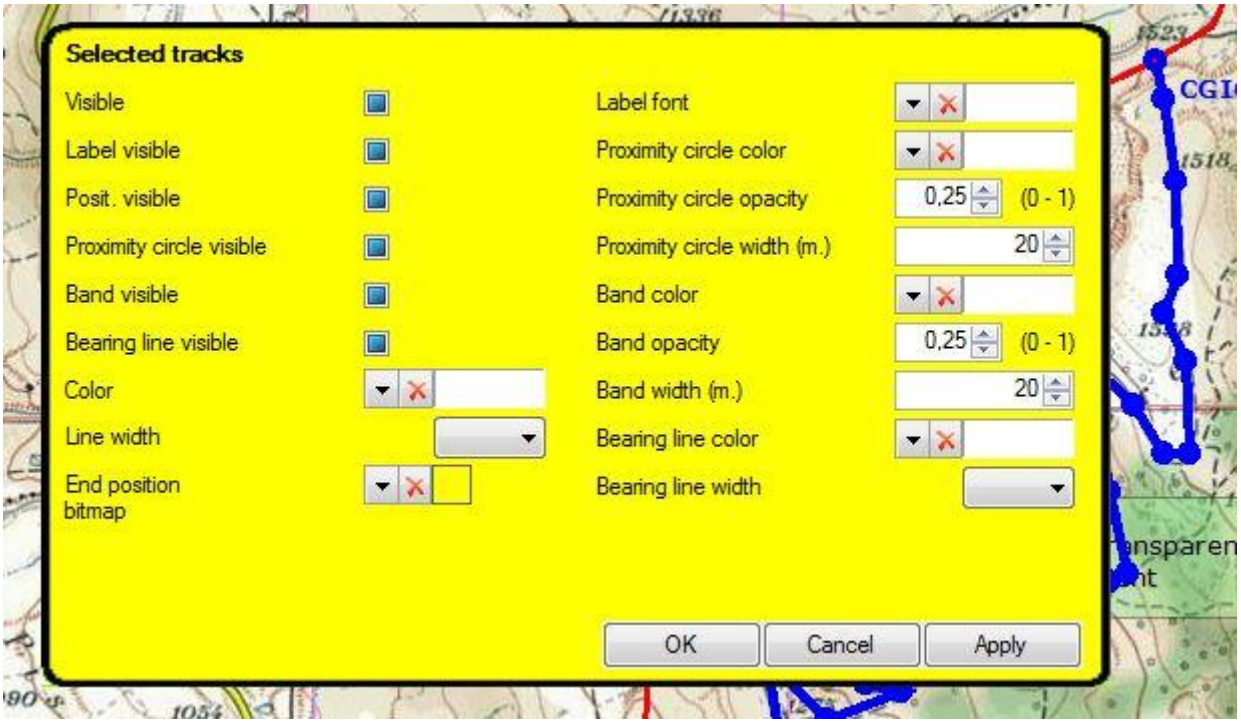
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

To modify all the selected tracks click the right mouse button anywhere on the map and select the context menu *Modify selected - Tracks*.

A window containing the following information common to multiple tracks is opened:

- Visible or hidden
- Label visible or hidden
- Last position visible or hidden
- Proximity circle visible or hidden
- Band visible or hidden
- Bearing line visible or hidden
- Color to use in drawing on the map
- Line thickness
- End position bitmap

- Font labels
- Proximity circle color
- Proximity circle opacity
- Proximity circle width in meters
- Band color
- Band opacity
- Band width in meters
- Bearing line color
- Bearing line width




Apply the same considerations to editing a track.

## Add a point to a track

To add a point at the end of a track, select the track, then select the appropriate tool with the menu *Tools - New track point* and then click the left mouse button on the map in relative position to the point you want to add.

To add a point in a track, select the point previous to that you want to insert, then proceed as above.

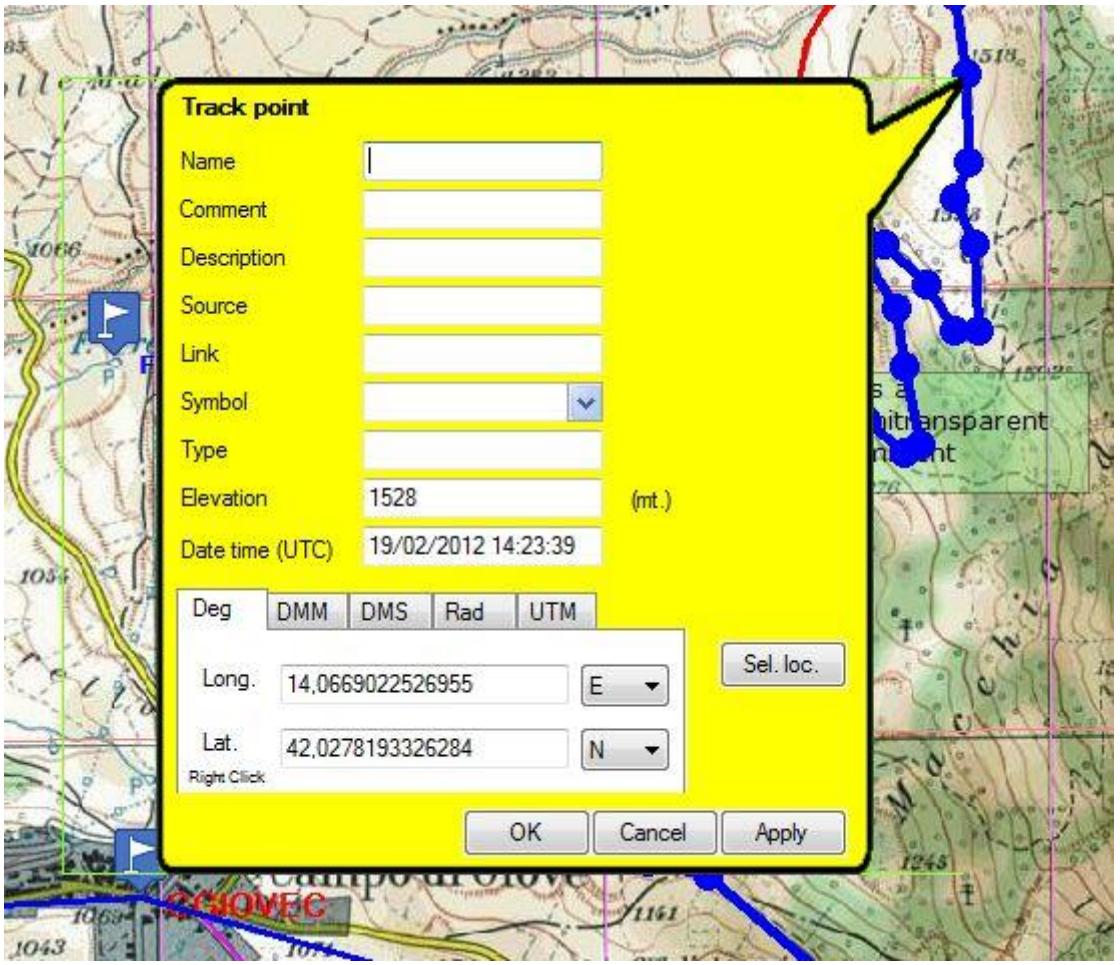
## Modify a point of a track

To modify a point of a track you can click the right mouse button on the track point and select the context menu *Modify – track point*.

A window containing the following information is opened:

- Point name
- Comment on the point
- Description of the point
- Origin of the point
- Link (URL) to additional information on the point
- Symbol to use (default list)
- Point type
- Altitude above sea level
- Date / hour

- Geographical coordinates




Where an icon appears with an arrow at the bottom, means that a function is available for easy insertion of information; by pressing the icon opens a window whose function depends on the type of information you must enter:

- *Symbol*: opens a window with a table containing the list of available symbols; to choose one, simply select the row and press the *Ok* button or double click with the left mouse button. The *Find* field, located above, facilitates the search for the desired symbol.

While entering the coordinates can be chosen their mode of representation, selecting:

- Degrees - coordinates expressed in decimal degrees
- GMM - coordinates expressed in degrees and decimal minutes
- GMS - coordinates expressed in degrees, minutes and decimal seconds
- UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
- Rad - expressed in decimal radiant

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Delete a point from a track

You can delete a route waypoint with the function List tracks.

Alternatively you can click the right mouse button on the track point and select the context menu *Delete - track point*.

If this is the last entered point, you can select the track and choose the context menu

*Delete last point - track*.

## Move a track

To move a track click with the right mouse button anywhere on the line connecting the points and to select the context menu *Move - track*.

A window is opened with four arrows buttons.

Press the buttons to move the waypoint in the desired direction.
The movement is made of how many pixels are shown in the near combo box.

Alternatively you can click the left mouse button on the object to move, hold and move the object in the desired position.

This is possible only if the menu "Lock objects on map" is disabled.

## Delete the tracks

You can delete a track with the function List tracks.

Alternatively you can click the right mouse button anywhere on the line connecting the points and select the context menu *Delete - track*.

To delete the selected tracks, click the right mouse button anywhere on the map and select the context menu *Delete selected - Tracks*.

To delete all tracks, click the button right-click anywhere on the map and select the context menu *Delete all - Tracks*.

In addition, to delete all data GPX click the right mouse button anywhere on the map and select the context menu *Delete all - GPX Data*.

Finally, to erase all GPX and vectorial data click the right mouse button anywhere on the map and select the context menu *Delete all - All*.

## Hide and unhide the tracks

It is possible to hide a track with the function List tracks.

In alternative it is possible to make click with the right key of the mouse anywhere on the line connecting the points and select the context menu *Hide - track*.

To hide the selected tracks make click the right mouse button anywhere on the map and select the context menu *Hide selected - Tracks*.

To unhide all the tracks click the right mouse button anywhere on the map and select the context menu *Unhide all - Tracks*.

## Simplify a track

You can simplify a track with the function List tracks, using the context menu *Simplify track*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Simplify - track*.

Create a new track with the same points of the indicated track. The name of the new track will be equal to the name of the origin track preceded by "C.".

Creates a new track with a maximum number of points equal to that defined in the function Preferences - Tracks. The name of the new track will be equal to the name of the origin track preceded by "S.".

## Duplicate a track

You can duplicate a track with the function List tracks, using the context menu *Duplicate track*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Duplicate - track*.

Create a new track with the same points of the indicated track. The name of the new track will be equal to the name of the origin track preceded by "C.".

## Invert a track

You can reverse a track with the function List tracks, using the context menu *Invert track*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Invert - track*.

Create a new track with the same points of the indicated track, but in inverse sequence. The name of the new track will be equal to the name of the origin track preceded by "I.".

## Join the tracks

You can add all the track points in a track named JOIN with the function List tracks, using the context menu *Add to the Join track*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Add to Join - track*.

All the track points are added in the track named "JOIN." If the track JOIN does not exist it is automatically created with the same characteristics as the current track.

## Join the segments of a track

You can merge the segments of a track with the function List tracks, using the context menu *One segment*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *One segment - track*.

## Set the altitude to a track

You can set the altitude of the points of a track using the DEM data available locally, with the function List tracks, using the context menu *Set DEM altitude*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Set DEM altitude - track*. A message may indicate the possible unavailability of the altimetric data.

If you want set the altitude on only one track point, select the track, then click the right mouse button on the track point and select the context menu *Set DEM altitude – track point*.

## Set the travel time to a track

You can set the date and time of the points of a track with the function List tracks, using the context menu *Set travel time*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Set travel time - track*.

## Navigate along a track

This function is used to obtain indications about the direction to navigate along a track; naturally assumes the use of a connected GPS device.

To navigate along a track, click the right mouse button anywhere on the line connecting the track points and select the context menu *Navigate - track*.

OkMap does the following:

- Activates the navigation mode
- Opens the window navigation data
- Opens the window navigate along a track

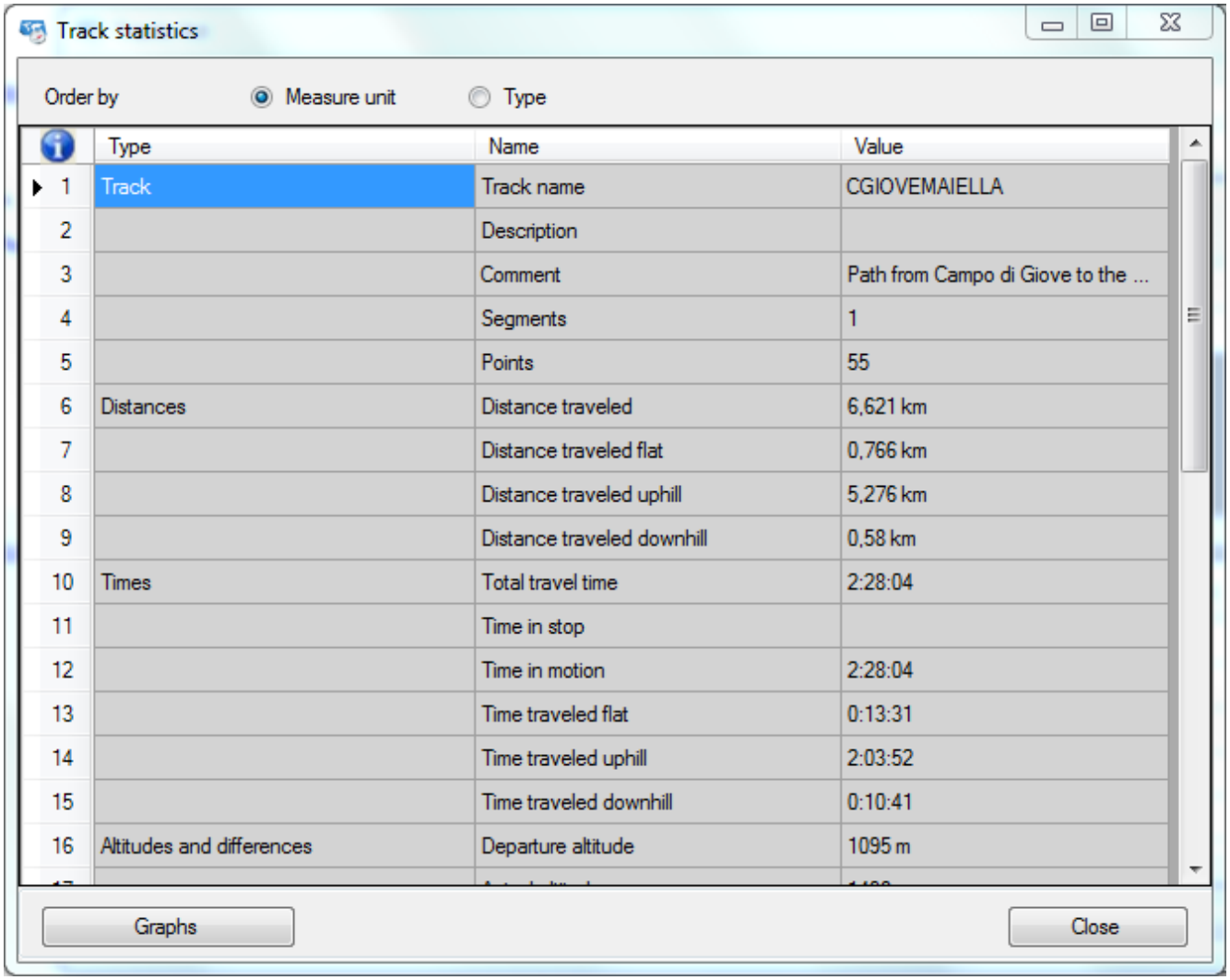
For the use of the single functions, see the relative pages.

## Track statistics

You can get statistic information on a track with the function List tracks, using the context menu *Statistics*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Statistics - track*.

The following window is displayed:




| | Type | Name | Value |
|---|---|---|---|
| 1 | Track | Track name | CGIOVEMAIELLA |
| 2 | | Description | |
| 3 | | Comment | Path from Campo di Giove to the ... |
| 4 | | Segments | 1 |
| 5 | | Points | 55 |
| 6 | Distances | Distance traveled | 6,621 km |
| 7 | | Distance traveled flat | 0,766 km |
| 8 | | Distance traveled uphill | 5,276 km |
| 9 | | Distance traveled downhill | 0,58 km |
| 10 | Times | Total travel time | 2:28:04 |
| 11 | | Time in stop | |
| 12 | | Time in motion | 2:28:04 |
| 13 | | Time traveled flat | 0:13:31 |
| 14 | | Time traveled uphill | 2:03:52 |
| 15 | | Time traveled downhill | 0:10:41 |
| 16 | Altitudes and differences | Departure altitude | 1095 m |

The information (more than 30 indicators) can be sorted by Measure unit or Type.

Information such as: timing, duration and speed will be available only if the points contain the *Date / time* information.

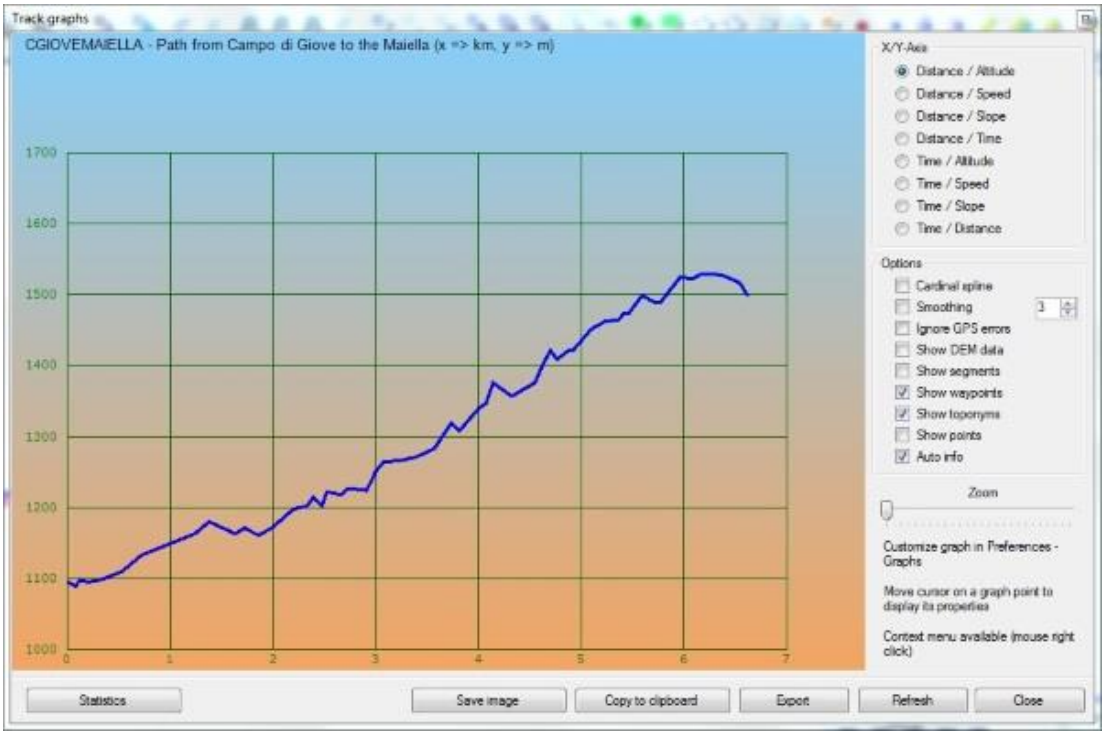
Information on quotas and gradients will be available only if the points contain *Altitude* information.

## Track graphs

You can get a chart with the function List tracks, using the context menu *Graphs*.

Alternatively you can click the right mouse button anywhere on the line connecting the track points and select the context menu *Graphs - track*.

The following window is displayed:




These types of graphs can be produced (X/Y axis):

- Distance / Altitude
- Distance / Speed
- Distance / Slope
- Distance / Time
- Time / Altitude
- Time / Speed
- Time / Slope
- Time / Distance

Some graphs will be displayed only if the points contain the information *Altitude* (or *Time* in case of speed).

You can select some options to modify the graph or make available some information.

Move the mouse over each graph point to obtain information (if available and "Auto info" is checked) on the relative point of the track:

- Segment number
- Point number
- Altitude
- Distance from the beginning of the track
- Time from the beginning of the track
- Date and time
- Instant velocity

There is also a context menu with the following functions:

- Info: to obtain information on the current point track
- Copy Coordinates: copy to the clipboard the coordinates of the current track point
- Salva waypoint: to save a new waypoint with the coordinates of the current track point
- Geocoding info: to obtain information on the geographic location of the current track point
- Find on opened map: to locate the track point on all the opened maps
- Trova in Geocaching.com: to find caches around the geographic location of the current track point

- Trova in Peakfinder.com: to view peaks around the geographic location of the current track point

# Import vectorial data

## Import OkMap vectorial data

Import vectorial data from an OkMap map means include in the current map the vectorial data of another map converting, if necessary, projection and reference datum.

The import is activated through the menu *File - Import - OkMap vectorial data (multi)*. Opens a dialog box that allows you to open one or more files with extension .okm.
If no map has been loaded, OkMap automatically creates a new vectorial map with the following features:

- Projection: Longitude / Latitude
- Datum: World Geodetic 1984 (WGS84)
- Geographical bounds: the same bounds of the vectorial data

The characteristics of the vectorial map automatically created can subsequently be modified through the menu *File - Modify - Map parameters*.

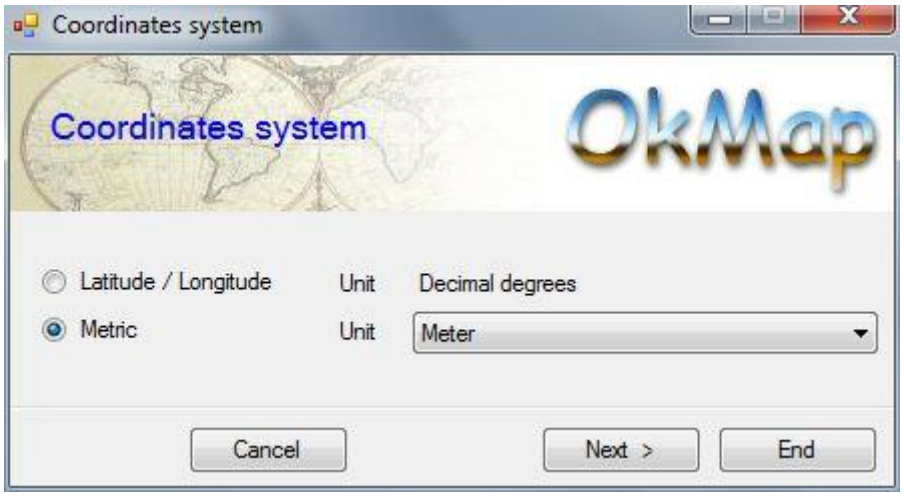
## Import SHP vectorial data

Import vectorial data in ESRI shape file format means include such vectorial data in the current map converting, if necessary, projection and reference datum.

The import is activated through the menu *File - Import - SHP vectorial data (multi)*. Opens a dialog box that allows you to open one or more files with extension .shp.
After the selection of files, a series of windows (wizard) are displayed to identify the characteristics of the coordinates and the map (type of coordinates, datum, projection and its parameters); all selected files must have naturally the same characteristics.

To switch between windows use the *Next* > and< *Previous* buttons. To close the wizard to press the *End* button; to cancel it press the *Cancel* button.

The first window is used to indicate the type of coordinates contained in the shp files.

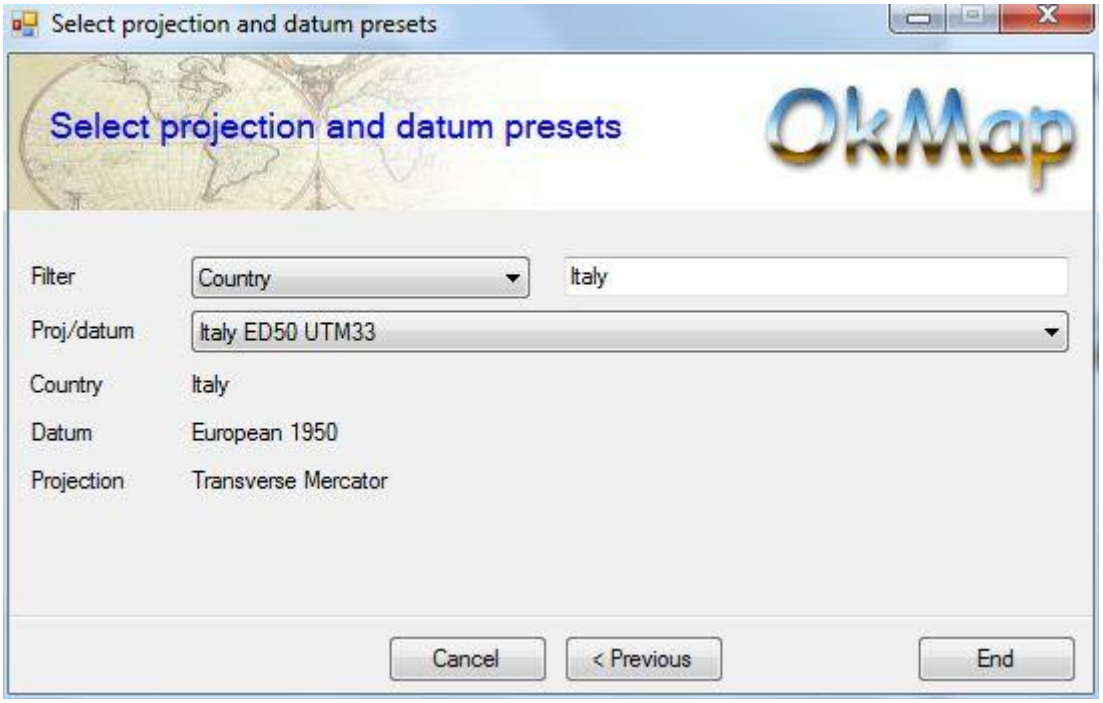



In this window you must specify whether the coordinates contained in the shp files are geographical or metric, in which case you must also specify the unit of measurement.

The sequence of windows that follows depends on the type of coordinates that were chosen; in the case of metric coordinates only reference datum is required; following shows the whole sequence that takes place in the case of geographic coordinates.

The next window is to indicate with a simple selection: reference datum, projection type and its parameters.

The data are stored in a database that contains a large number of definitions used by most nations in the layout their own maps.




The list shows only the presets of datum / projections active. To enable or disable one or more definitions use the function List - Presets.

Once you select the wizard ends. If it was not possible to identify the characteristics of the map you are creating, you can proceed to a manual selection of information, leaving empty the selection field and pressing the *Next* > button.

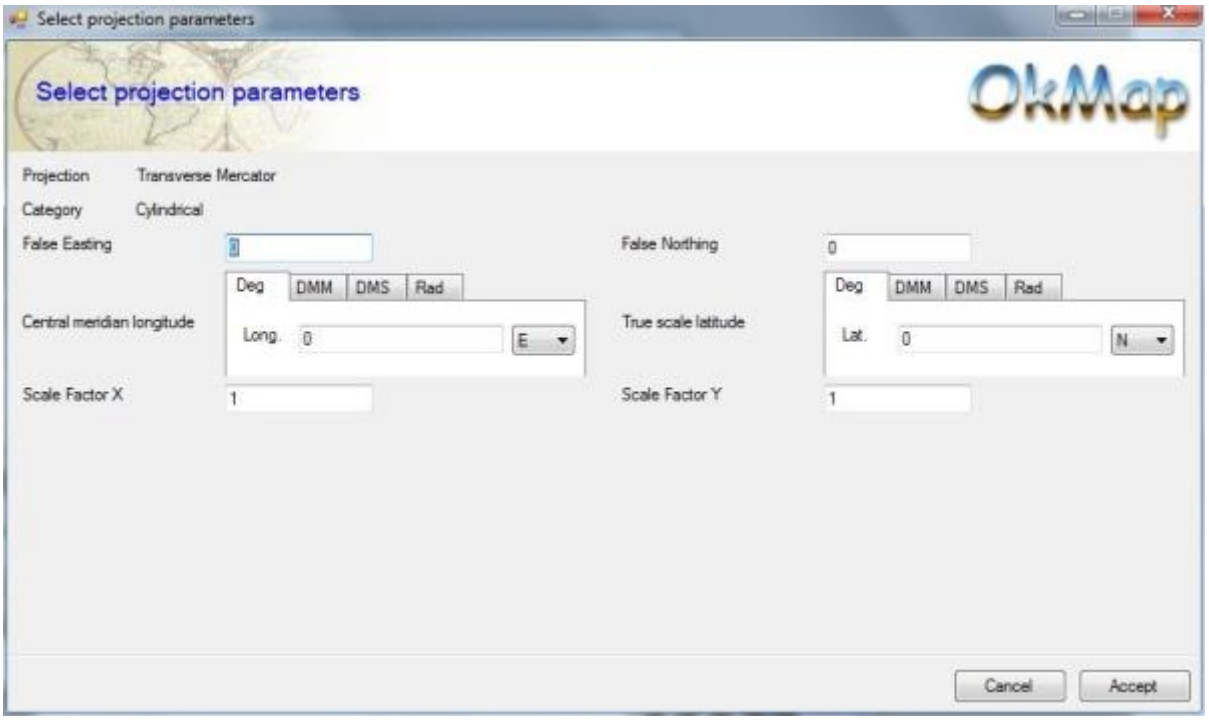
In this case a window is displayed to define the datum used by the map.

The list shows only the presets of datum / projections active. To enable or disable one or more definitions use the function List - Datum.

Going forward, a window is displayed to define the type of projection used by the map.

If the desired projection did not appear in the list and the surface of the map covers a small region, one can obtain a good approximation by selecting the projection *Longitude / Latitude*.

Once selected the projection, press the button *Parameters* to indicate the projection parameters.

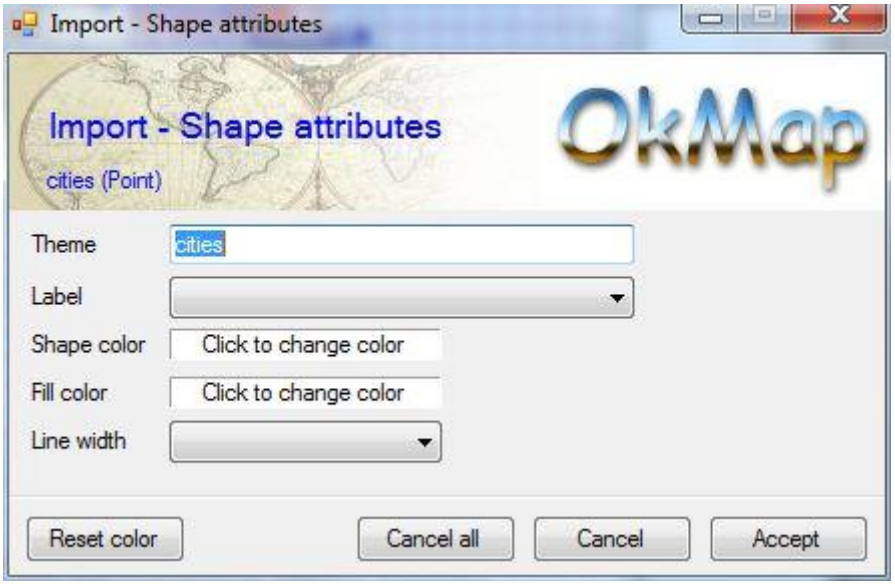



The type and number of parameters depend on the projection in question. For more information refer to the *Projection parameters* of the page [What are the cartographic projections](#).

Do not make the selection of parameters is equivalent to set the center of the projection on the Greenwich meridian to the equator, the false east and north to zero and the scale factor to 1.

The *Accept* button acquire information about the parameters and redisplays the window of choice of the projection. The *End* button ends the wizard related to the setup of the data.

For each imported file, some attributes are required to create the corresponding vectorial theme.




In this window the following are required:

- The name of the theme (if it already exists a substitution confirm is required).
- The field of the database connected to the shp data where is contained the label to be attributed to the single shapes (if applicable).
- The color to be attributed to the single shapes (if applicable).
- The fill color to be attributed to the single shapes (if applicable).
- The line thickness to be used in the drawing of the single shapes (if applicable).

The *Reset color* button cancel the choices of color made in the boxes where appears the writing *click to change color*.

The *Accept* button acquires the choices made for the current theme and go to the following theme (file shp).

The *Cancel* button skips the choices made for the current theme and go to the following theme (file shp).

The *Cancel all* button cancel the choices made for the current theme and skips the requests for the following themes (file shp).

If no map has been loaded, OkMap automatically creates a new vectorial map with the following features:

- Projection: Longitude / Latitude
- Datum: World Geodetic 1984 (WGS84)
- Geographical bounds: the same bounds of the vectorial data

The characteristics of the vectorial map automatically created can subsequently be modified through the menu *File - Modify - Map parameters*.

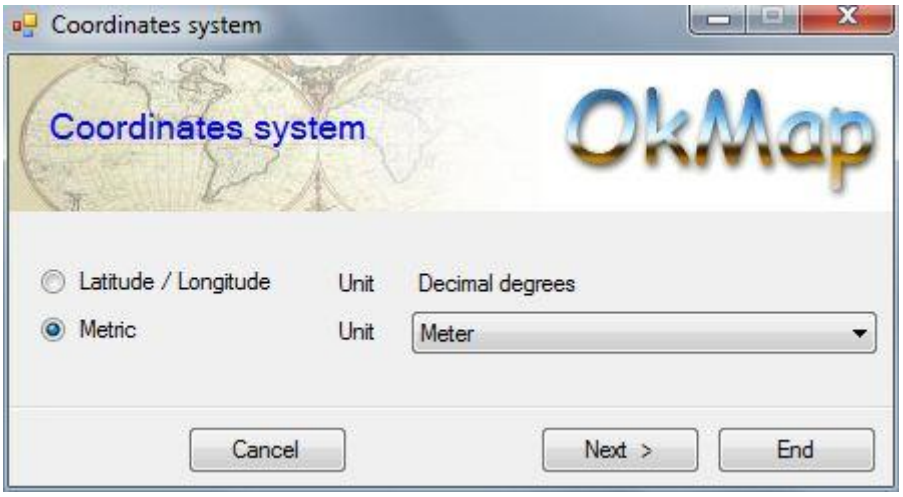
## Import DCW polygons

Import vectorial data in DCW format (Digital Chart of World) means include in the current map such vectorial data converting, if necessary, projection and reference datum.

The import is activated through the menu *File - Import - DCW polygon data (multi)*. Opens a dialog box that allows you to open one or more files with extension .txt.
After the selection of files, a series of windows (wizard) are displayed to identify the characteristics of the coordinates and the map (type of coordinates, datum, projection and its parameters); all selected files must have naturally the same characteristics.

To switch between windows use the *Next* > and< *Previous* buttons. To close the wizard to press the *End* button; to cancel it press the *Cancel* button.

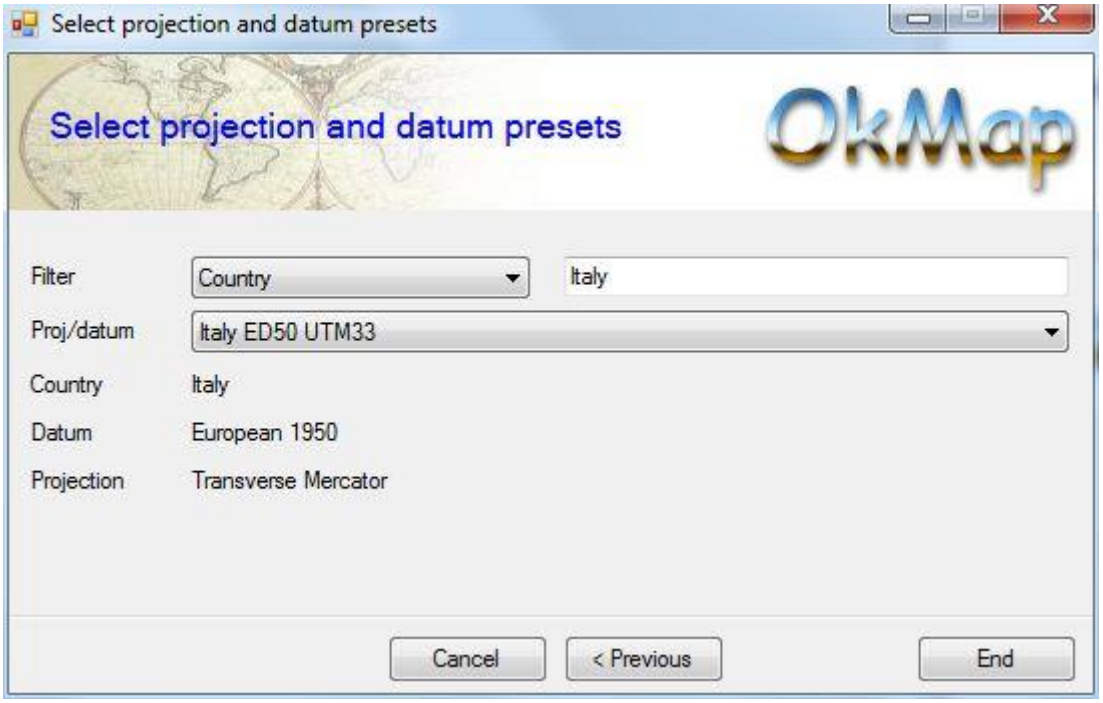
The first window is used to indicate the type of coordinates contained in the Dcw files.




In this window you must specify whether the coordinates contained in the shp files are geographical or metric, in which case you must also specify the unit of measurement.

The next window is to indicate with a simple selection: reference datum, projection type and its parameters.

The data are stored in a database that contains a large number of definitions used by most nations in the layout their own maps.



The list shows only the presets of datum / projections active. To enable or disable one or more definitions use the function List - Presets.

Once you select the wizard ends. If it was not possible to identify the characteristics of the map you are creating, you can proceed to a manual selection of information, leaving empty the selection field and pressing the *Next* > button.

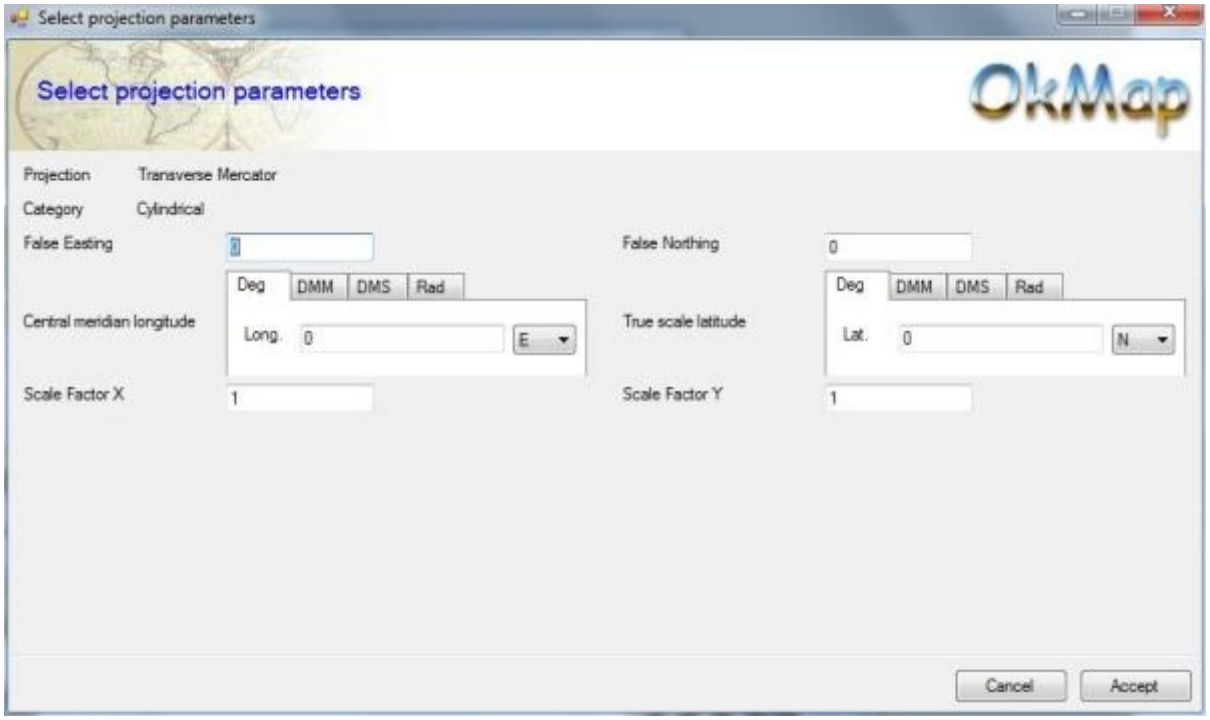
In this case a window is displayed to define the datum used by the data you are importing.

The list shows only the presets of datum / projections active. To enable or disable one or more definitions use the function List - Datum.

Going forward, a window is displayed to define the type of projection used by the data you are importing.

If the desired projection did not appear in the list and the surface of the map covers a small region, one can obtain a good approximation by selecting the projection *Longitude / Latitude*.

Once selected the projection, press the button *Parameters* to indicate the projection parameters.




The type and number of parameters depend on the projection in question. For more information refer to the *Projection parameters* of the page [What are the cartographic projections](#).

Do not make the selection of parameters is equivalent to set the center of the projection on the Greenwich meridian to the equator, the false east and north to zero and the scale factor to 1.

The *Accept* button acquire information about the parameters and redisplays the window of choice of the projection. The *End* button ends the wizard related to the setup of the data.

For each imported file will be created a new vectorial theme with the same file name, and if the theme already exists will be asked a confirm of replacement.

If no map has been loaded, OkMap automatically creates a new vectorial map with the following features:

- Projection: Longitude / Latitude
- Datum: World Geodetic 1984 (WGS84)
- Geographical bounds: the same bounds of the vectorial data

The characteristics of the vectorial map automatically created can subsequently be modified through the menu *File - Modify - Map parameters*.

# Export vectorial data

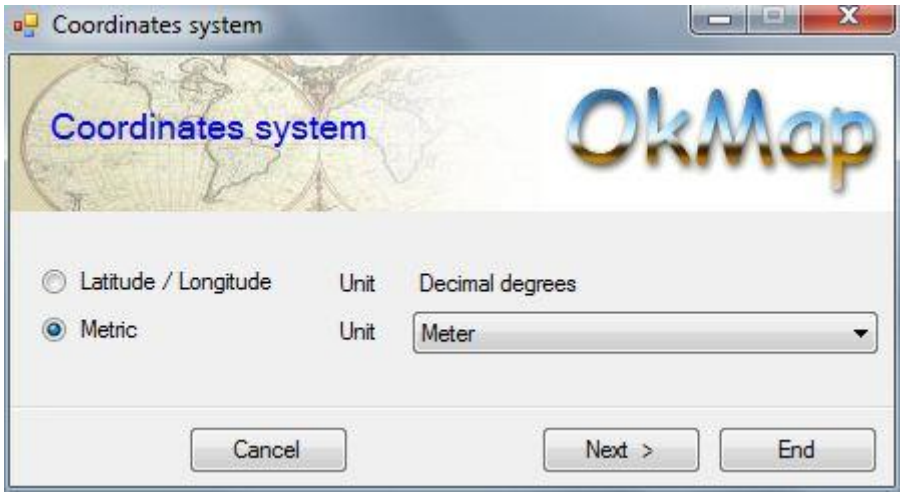
## Export SHP vectorial data

Export vectorial data in ESRI shape file format means creating vectorial data in that format from those loaded in the current map using the requested type of coordinates.

The export is activated through the menu *File - Export - SHP vectorial data*.

This opens a dialog box to select the folder where to save the files in ESRI shape file format.

Subsequently a window is displayed to acquire the type of coordinates you want to export.




In this window you must specify whether the coordinates contained in the shp files are geographical or metric, in which case you must also specify the unit of measurement.

For each vectorial theme, three files will be created, according to the standard ESRI, with the extension .shp, .dbf and .shx.

The .dbf files are organized in the following format:

- ID: progressive number
- NAME: shape label
- COLOR: shape color
- FILLCOLOR: shape fill color
- LINEWIDTH: line thickness used in the draw of the shape

# GPS communications

## Receive data from GPS

This function must be used only for GPS devices that support their proprietary communication protocol. For others GPS, copy GPX files directly from the mass storage device mounted on your computer.

Before to access this function, make sure you have properly configured the parameters for communication with the GPS in the function Preferences - GPS.

Receiving data from the GPS is activated through the menu *GPS* - *Receive*.

A window is displayed to select the data you want to receive.

Receive data from GPS
Receive data from GPS
OkMap
This function must be used only for GPS devices that support their proprietary communication protocol.
For others GPS, copy GPX files directly from the mass storage device mounted on your computer.
Select which kind of information to receive:
Waypoints
Routes
Tracks
Action if information already exists:
Replace
Add with new name
Skip
GPSBabel
Receive
Close

In this window you can specify which types of GPX data you want to receive:

- Waypoints
- Routes
- Tracks

and the action to do if the element already exists in memory:

- Replace: the element lo load replace the existent element;
- Add with new name: it will be generated a new unique name for the element to load that will be added;
- Skip: the element to load will be ignored.

The *End* button acquire the information and receive the data. The *Close* closes the window.

## Send data to GPS

This function must be used only for GPS devices that support their proprietary communication protocol. For others GPS, copy GPX files directly to the mass storage device mounted on your computer.

Before to access this function, make sure you have properly configured the parameters for communication with the GPS in the function Preferences - GPS.

Transfer data to the GPS is activated through the menu *GPS - Send*.

A window is displayed to select the data you want to send.

In this window you can specify which types of GPX data you want to send:

- Waypoints
- Routes
- Tracks

You can also select the objects to send:

- All: all the mentioned above GPX data are sent.
- Only selected: only the mentioned above selected GPX data are sent.

The *End* button acquire the information and send the data. The *Close* closes the window.

## Turn off the GPS

Before to access this function, make sure you have properly configured the parameters for communication with the GPS in the function Preferences - GPS.

You can turn off the GPS through the menu *GPS - Turn off*.

Only some GPS models are enabled to be turned off by software.

# Navigation

## Navigation mode

The navigation mode is used to establish a connection with the connected GPS and to begin receiving data via the NMEA protocol.

NMEA 0183 is a standard interface between digital equipment and is mainly used in nautical applications (autopilot systems, etc..).

Only a subset has importance within the GPS; in these case the system is used to transmit NMEA data from a GPS receiver to a computer.

Before to access this function, make sure you have properly configured the parameters for communication with the GPS in the function Preferences - NMEA and have correctly plugged the GPS.

The function is activated / deactivated through the menu *Navigate – NMEA communication*.

When you activate the navigation mode, the Navigation data window is displayed.

To exit the navigation mode (receiving NMEA) use again the menu *Navigation - NMEA communication*.

If the state *communication with GPS failed* persists check:

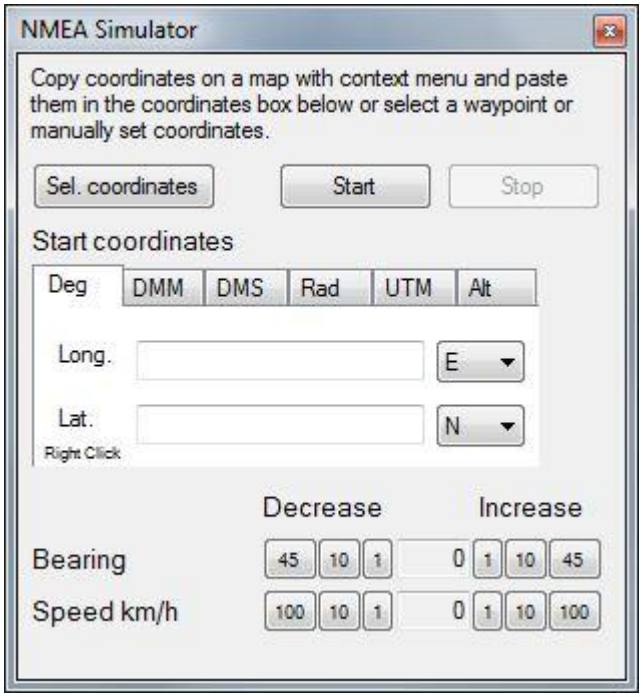
- The communication parameters set in the Preferences - NMEA function.
- The connection cable between computer and GPS or Bluetooth communication.
- The GPS is turned on and is working.

## Navigation simulator

The simulation mode is used to simulate the receiving of navigation data from a GPS via the NMEA protocol.

The emulated NMEA sentenced is $GPRMC.

The function is activated through the menu *Navigation - NMEA simulator*.
The following window is displayed.




Before starting the simulation is necessary to specify the starting coordinates; this can be done:

- Manually specifying the coordinates in the formats:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant
- Selecting the coordinates through the button *Sel. coordinates*.
- Using the *Paste* function of the context menu of the box coordinates (before you must have copied the point coordinates on a map with the context menu or you must have copied the coordinates from another coordinates box).

When you activate the simulation mode with the button *Start*, the Navigation data window is displayed.

To stop the simulation use the *Stop* button.

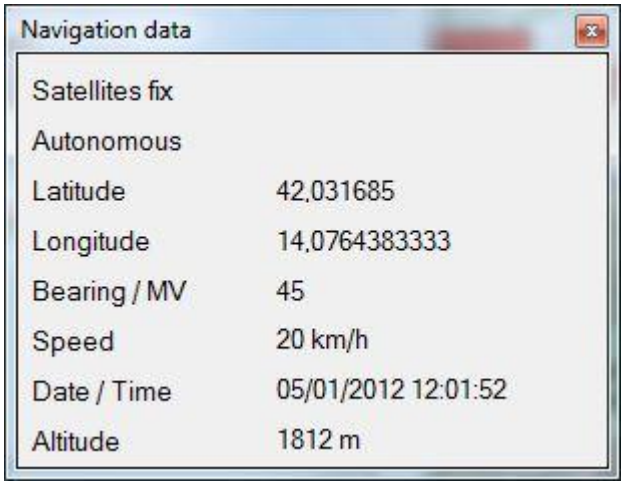
You can change direction and speed increasing / decreasing with the respective buttons.

## Navigation data

This function provides real time information on the navigation data received from the connected GPS via NMEA protocol.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate - Navigation data*.
The following window is displayed.




The information displayed in this window are:

- Connection status
- Latitude: latitude of the last received position
- Longitude: longitude of the last received position
- Bearing / MV: direction followed and magnetic variation
- Speed: instant speed
- Date/Time: Date and time of the last received position
- Altitude: last received altitude above sea level

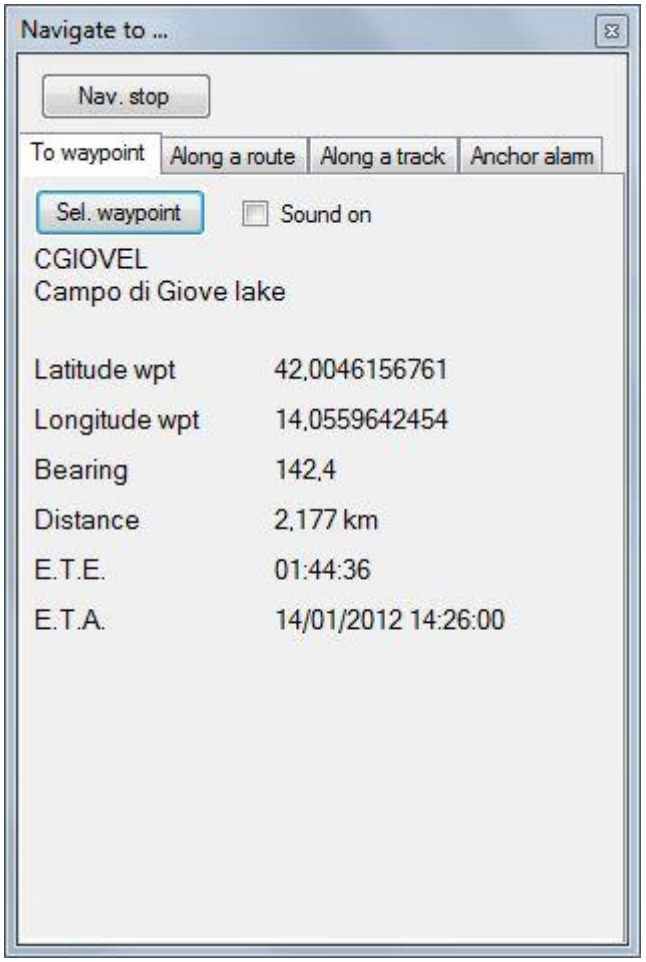
The information is updated automatically when you receive a new NMEA sentence from GPS.

## Navigate toward a waypoint

This function provides real time information to reach a waypoint during the NMEA navigation with the connected GPS.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate - Navigate to… - To waypoint*.
The following window is displayed.




The information displayed in this window are:

- Sound on: if activated, near the waypoint, you hear a sound; wav file is configurable in the function Preferences - Sounds
- Name of the selected waypoint
- Latitude wpt: latitude of the selected waypoint Longitude wpt: longitude of the selected waypoint Direction: direction to be followed
- Distance: distance between the current position and the waypoint
- E.T.E. (Estimated Time of Enroute): estimated time to reach the waypoint
- E.T.A. (Estimated Time of Arrival): estimated time of arrival at waypoint

With the *Sel. waypoint* button you can choose the waypoint of destination; a table containing the list of selectable waypoints is displayed.

For more information about the general use of tables, see the topic Data tables.

To select a waypoint, select a row and press the *Apply* button or simply double-click with the left mouse button in the row to be selected.

To facilitate the search of a waypoint, fill the *Find* field with the leading characters of the column on which the sort order is selected.

The information is updated automatically when you receive a new NMEA sentence from GPS.

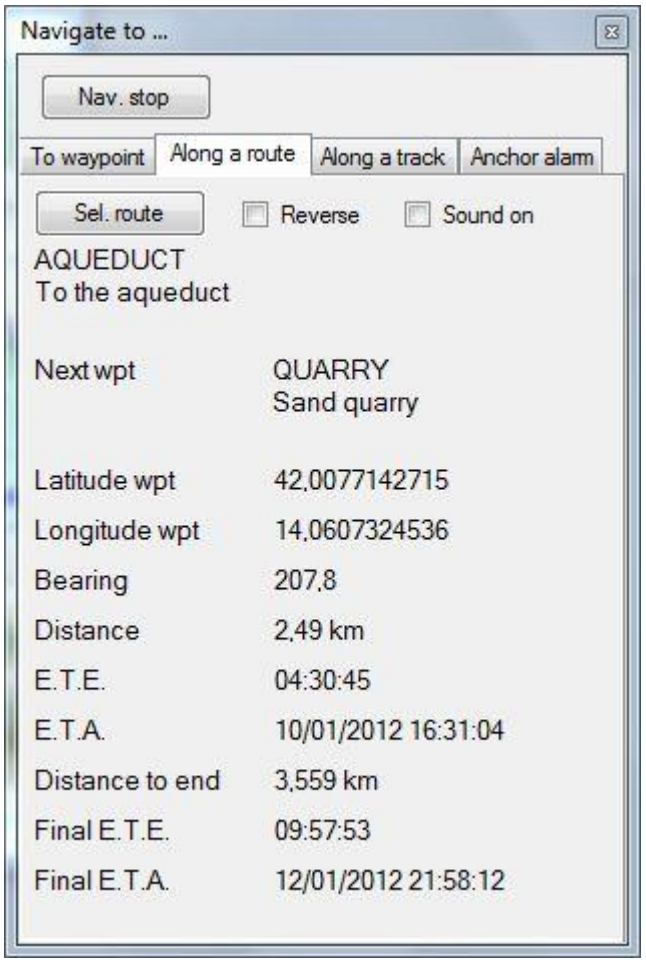
## Navigate along a route

This function provides real time information to follow a route during the NMEA navigation with the connected GPS.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate - Navigate to… - Along a route*.

The following window is displayed.




The information displayed in this window are:

- Reverse: if activated it follows the route beginning from the end
- Sound on: if activated, in proximity of a waypoint, a sound is sent forth; the file wav is configurable in the function Preferences - Sounds
- Name of the selected route
- Comment on the selected route
- Description of the selected route
- Next wpt: name of the next waypoint to reach
- Latitude wpt: latitude of the next waypoint
- Longitude wpt: longitude of the next waypoint
- Bearing: direction to be followed for reaching the next waypoint
- Distance: distance between the current position and the next waypoint
- E.T.E. (Estimated Time of Enroute): estimated time to reach the next waypoint
- E.T.A. (Estimated Time of Arrival): estimated time of arrival at next waypoint
- Distance to end: between the current position and the end of the route
- E.T.E. (Estimated Time of Enroute): estimated time to reach the end of the route
- E.T.A. (Estimated Time of Arrival): estimated time of arrival at end of the route

With the *Sel. route* button you can choose the route to follow; a table containing the list of selectable routes is displayed.

For more information about the general use of tables, see the topic Data tables.

To select a route, select a row and press the *Apply* button or simply double-click with the left mouse button in the row to be selected.

To facilitate the search of a route, fill the *Find* field with the leading characters of the column on which the sort order is selected.

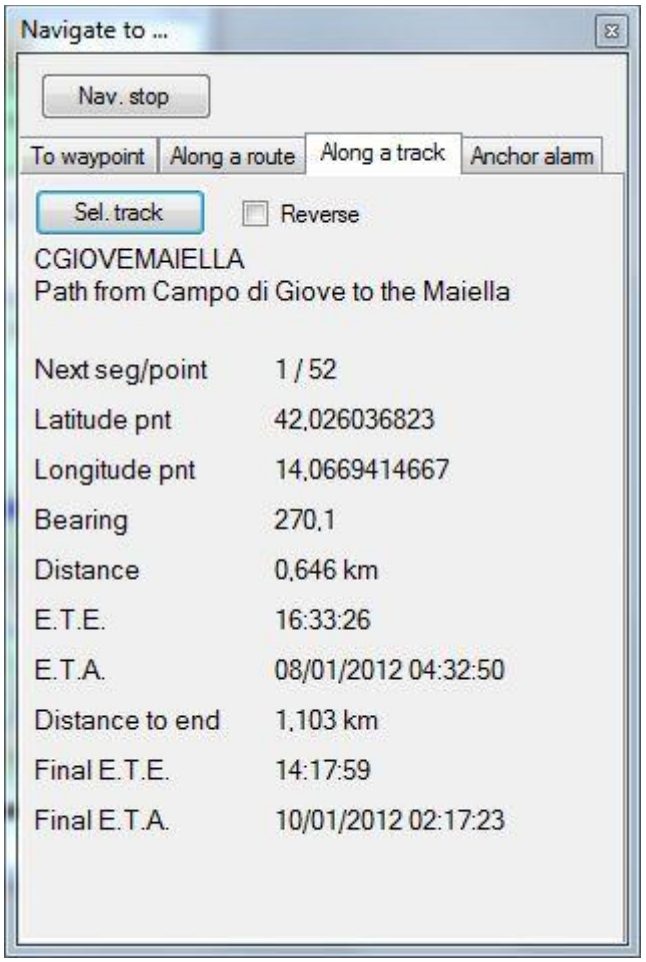
The information is updated automatically when you receive a new NMEA sentence from GPS.

## Navigate along a track

This function provides real time information to follow a track during the NMEA navigation with the connected GPS.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate - Navigate to… - Along a track*.
The following window is displayed.




The information displayed in this window are:

- Reverse: if activated it follows the track beginning from the end
- Name of the selected track Comment on the selected track Description of the selected track
- Next seg/point: number of the next segment and point of the track to be reached
- Latitude pnt: latitude of the next point
- Longitude pnt: longitude of the next point
- Bearing: direction to be followed for reaching the next point
- Distance: between the current position and the next point
- E.T.E. (Estimated Time of Enroute): estimated time to reach the next point
- E.T.A. (Estimated Time of Arrival): estimated time of arrival at next point
- Distance to end: between the current position and the end of the track
- E.T.E. (Estimated Time of Enroute): estimated time to reach the end of the track
- E.T.A. (Estimated Time of Arrival): estimated time of arrival at end of the track

With the *Sel. track* button you can choose the track to follow; a table containing the list of selectable tracks is displayed.

For more information about the general use of tables, see the topic Data tables.

To select a track, select a row and press the *Apply* button or simply double-click with the left mouse button in the row to be selected.

To facilitate the search of a track, fill the *Find* field with the leading characters of the column on which the sort order is selected.

The information is updated automatically when you receive a new NMEA sentence from GPS.

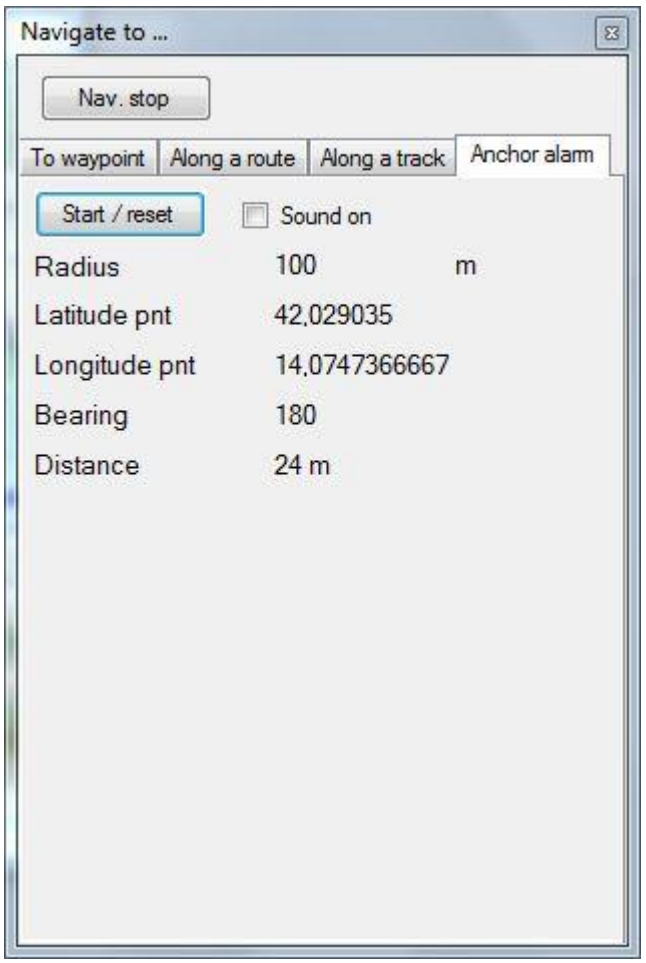
## Anchor alarm

This feature provides an alarm if you deviate too much from a particular point (anchor), during the NMEA navigation with the connected GPS.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate – Navigate to… - Anchor alarm*.

The following window is displayed.




The information displayed in this window are:

- Sound on: if activated, if you deviate too much from the point, you hear a sound; wav file is configurable in the function Preferences - Sounds Radius: determines the minimum distance to turn on the alarm Latitude pnt: latitude of the selected

point
- Longitude pnt: longitude of the selected point
- Direction: direction to be followed for returning to the point
- Distance: distance between the current position and the selected point

The *Reset* button establishes a new point with the last position received by the GPS.

To turn off the alarm uncheck the *Sound on* option or establish a new reference point.

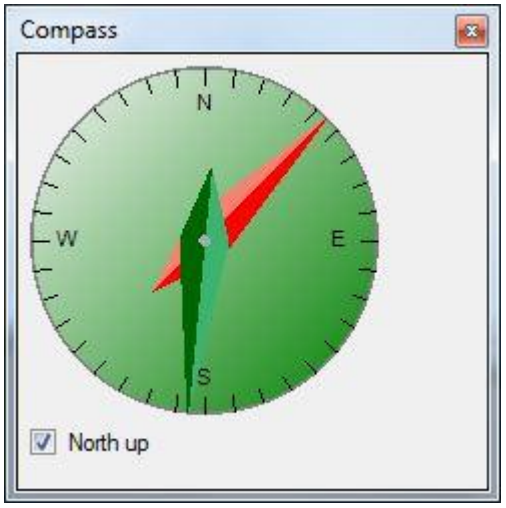
The information is updated automatically when you receive a new NMEA sentence from GPS.

## Compass

This function provides real time information on the navigation data received from the connected GPS via NMEA protocol.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate - Navigation data*.
The following window is displayed.




The information displayed in this window are:

- A compass with a needle (red) indicating the followed direction and possibly a second needle (green) which indicated the direction to follow when is activated the function *Navigate to…*; the background color can be:
  - Red: communication with the GPS failed
  - Yellow: the satellite signal is weak
  - Green: communication with the GPS working

- North up: if activated fixes the north the top center of the compass, otherwise the ring is rotated depending on the direction followed

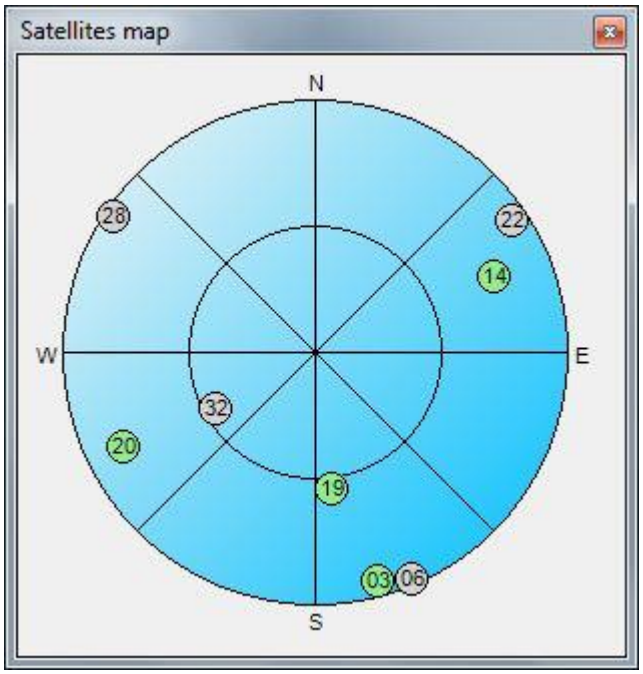
The information is updated automatically when you receive a new NMEA sentence from GPS.

## Satellites map

This function provides real time information on the signal quality of satellites in view received from the connected GPS via NMEA protocol.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate – Satellites map*.
The following window is displayed.




You'll see a sky map with the location of satellites.
Each satellite is represented by a colored dot with the number of the satellite inside.
The meaning of colors is as follows:

- Gray: satellite non used
- Red: SNR (Signal to Noise Ratio) <= 10
- Yellow: SNR (Signal to Noise Ratio) > 10 and <= 20
- Green: SNR (Signal to Noise Ratio) > 20

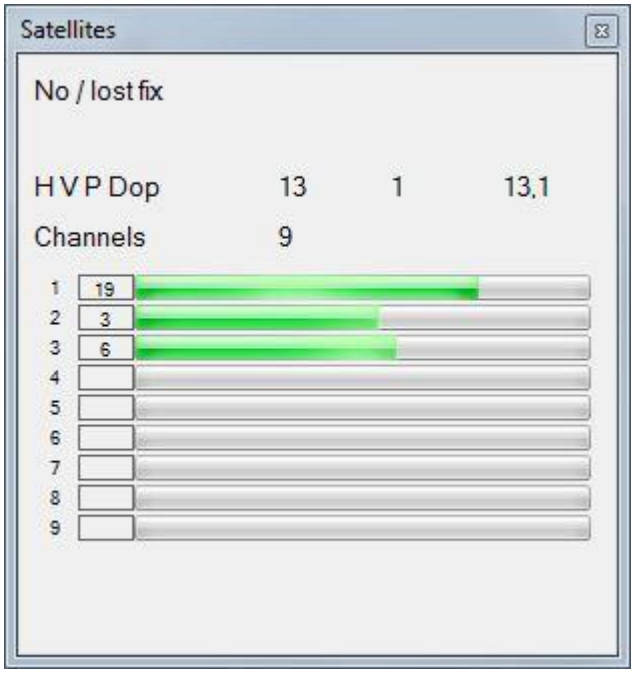
The information is updated automatically when you receive a new NMEA sentence from GPS.

## Satellites in view

This function provides real time information on the signal quality of satellites in view received from the connected GPS via NMEA protocol.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate - Satellites*.
The following window is displayed.




The information displayed in this window are:

- Connection status
- H V P Dop: Horizontal, Vertical, Position DOP (Dilution of Precision) define the goodness of the geometry of the satellites in view, if the satellites are close together then the geometry is weak and the DOP value is high, if the satellites are far apart, the geometry is strong and the DOP is low;
- Number of active channels
- Channel table (maximum 20):
  - Value of SNR (Signal to Noise Ratio)
  - Graph bar of the previous value

For values of DOP you may refer to the following table:

| DOP | Evaluation |
|---|---|
| 1 | Ideal |
| 2-3 | Excellent |
| 4-6 | Good |
| 7-8 | Discreet |
| 9-20 | Scarce |
| 21-50 | Bad |

The information is updated automatically when you receive a new NMEA sentence from GPS.

## Record the GPS track log

This function is used to record a GPX track (track log) with the data received from the connected GPS via the NMEA protocol.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated / deactivated through the menu *Navigate - Record GPS track*.

The recorded track is named *ACTIVE LOG*.

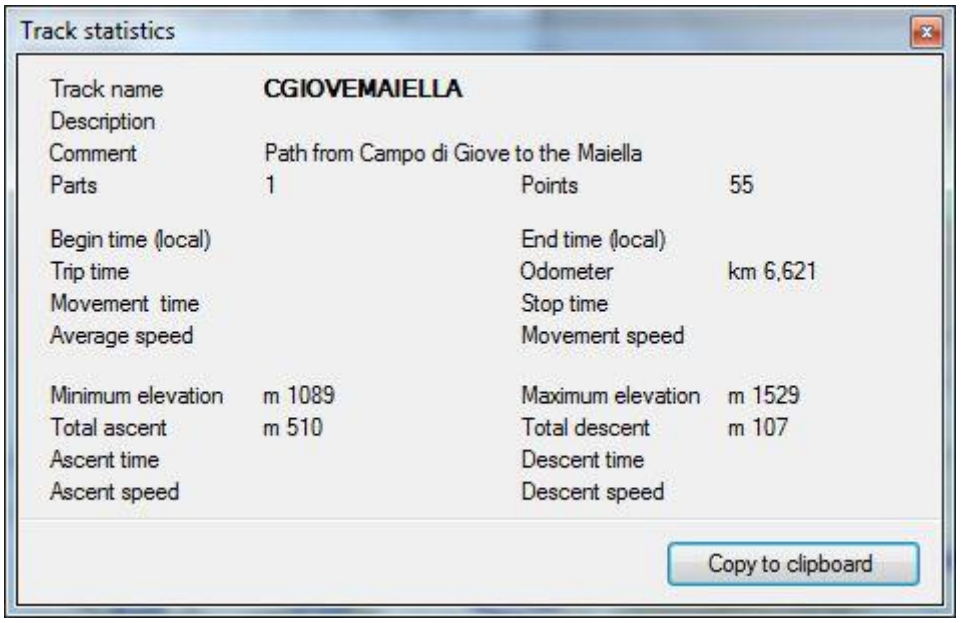
Each time you resume recording the track a new segment is created.

## GPS track statistics

This function provides real time statistics on the track log received from the connected GPS via NMEA protocol.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate – GPS track statistics*.
The following window is displayed.




The function is identical to Track statistics.

The information is updated automatically when you receive a new NMEA sentence from GPS.

## GPS track graphs

This function provides real time information on altitude profile / speed of the track log received from the connected GPS via NMEA protocol.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate – GPS track graphs*.

The following window is displayed.

The function is identical to Track graphs.

The information is updated automatically when you receive a new NMEA sentence from GPS.

## Save the current position

With this function you can save the current position as a new waypoint during the NMEA navigation with the connected GPS.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated through the menu *Navigate* - *Save waypoint position*.

The new waypoint will be added to the existing data GPX; the name used is an automatically generated serial number.

## Send current position to OkMap

This function is used to send the current location to a remote server, during the navigation NMEA with the connected GPS.

The computer that sends data is defined client, while the computer that receives data is defined server; multiple clients can send data simultaneously to the same server.

The OkMap server receives data activating the receive data from remote OkMap function; this information can be displayed on a map obtaining the tracks of the clients movements.

Before to access this function, make sure you have properly configured the parameters for communication by socket in the function Preferences – Send OkMap and you are connected to the network.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated / deactivated through the menu *Navigate* - *Send position*.

## Send current position to GpsGate

This function is used to send the current location to the remote server GpsGate.com, during the navigation NMEA with the connected GPS.

The computer that sends data is defined client, while the computer that receives data (in this case GpsGate.com) is defined server; multiple clients can send data simultaneously to the server.

To use this feature you must first subscribe to GpsGate.com.

To receive the positions of the clients you can activate the receive data from GpsGate.com function; this information can be displayed on a map obtaining the tracks of the clients movements.

Before to access this function, make sure you have properly configured the parameters for communication to the server in the function Preferences - GpsGate.com and you are connected to the network.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated / deactivated through the menu *Navigate - Send to GpsGate.com*.

## Center the map

This function is to keep the map centered during the navigation NMEA with the connected GPS.

This function only works if the Navigation mode or Navigation simulator are active.

The function is activated / deactivated through the menu *Navigate - Keep center map*.

# Receive remote data

## Receive data from remote OkMap

This function is to receive the current positions of the users that use the send current position to OkMap function.

The computer that sends data is defined client, while the computer that receives data is defined server; multiple clients can send data simultaneously to the same server.

The data received can be displayed on a map in the form of tracks getting constantly geographical locations of the clients.

Before to access this function, make sure you have properly configured the parameters for communication by socket in the function Preferences - Receive OkMap and you are connected to the network.

The function is activated / deactivated through the menu *Remote data - Receive OkMap tracks*.

For each client that sends data, a new track will be created with the same name as identifier of that client (as defined in the client computer in the Preferences – Send OkMap function).

To view with an icon the current location of the client, activate the *View - Tracks last pos.* menu.

The GPX data on the map are continually redesigned to ensure real time display of received data.

## Receive data from GpsGate.com

This function is to receive the current positions of the users that use the send position to GpsGate function.

To use this feature you must first subscribe to GpsGate.com.

The computer that sends data is defined client, while the computer that receives data is defined server; multiple clients can send data simultaneously to the same server.

The data received can be displayed on a map in the form of tracks getting constantly geographical locations of the clients.

Before to access this function, make sure you have properly configured the parameters for communication from GpsGate.com in the function Preferences - GpsGate.com and you are connected to the network.
The function is activated / deactivated through the menu *Server - GpsGate.com active*. For each client that sends data, a new track will be created with the same name as identifier of that client ((as defined during the subscribing to the site GpsGate.com).

To view with an icon the current location of the client, activate the *View - Tracks last pos.* menu.

The GPX data on the map are continually redesigned to ensure real time display of received data.

# Utility functions

## Distance calculation

This function is used to calculate distances between two or more points on the map using the mouse.

To activate the distance calculation use the menu *Tools* - *Distance*; click the left mouse button on the map to indicate the start point, then indicate, using the same method, the intermediate points and the end point.

On the map is drawn a broken line joining the points; this is the path of which you are making the measurement; the characteristics of the line and the unit of measurement of the result can be customized in the Preferences – Distance, area function.

The calculated measure is indicated in the bottom status bar.

To clear the measurement and the line on the map you can use the menu *Tools* - *Reset distance / area*.

## Area calculation

This function is used to calculate an area on the map using the mouse.

To activate the area calculation use the menu *Tools* - *Area*; click the left mouse button on the map to indicate the first node of the polygon, and subsequently indicate, using the same method, the remaining nodes of the polygon.

On the map is drawn a polygon that identifies the area of which he is effecting the measure; this is the area of which you are making the measurement; the characteristics of the line and the unit of measurement of the result can be customized in the Preferences – Distance, area function.

The calculated measure is indicated in the bottom status bar.

To clear the measurement and the polygon on the map you can use the menu *Tools* - *Reset distance / area*.

## Google Earth

his function is used to automatically open Google Earth (which must have been previously installed on your computer) in the same position of the loaded map (either raster or vectorial) and to display all the GPX data loaded.

The map itself, if raster, is displayed overlapped in Google Earth but only if it has compatible format (jpg, bmp, tif, tga, png, gif, ppm, pgm).

To activate Google Earth use the menu *Utilities* - *Google Earth*.

Data are stored in Google Earth under the topic *Temporary places - OkMap*.
To change the transparency of the map move the slider contained in the box *Places*. Google Earth is already set by OkMap to get a 3D view; you can still act on the sliders of Google Earth to change the display mode.

You can, leave Google Earth open, show OkMap window, load another map and call again Google Earth; you can obtain the union of different maps and data GPX.

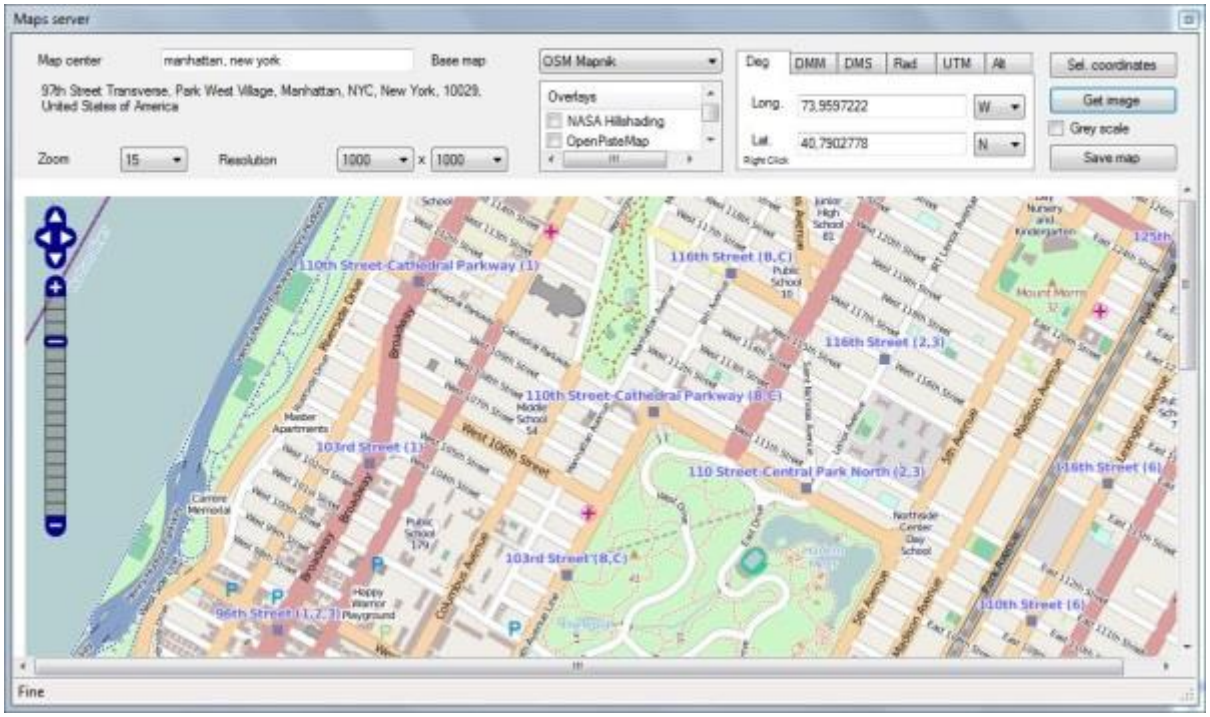
## Google Maps

This function is used to automatically open Google Maps in the same position of the loaded map (either raster or vectorial).

To activate Google Maps use the menu *Utilities - Google Maps*. Your computer must be connected to the Internet.

## Maps server

It's a function that can display and save a map locally and create a calibration file (.okm) for OkMap.




To activate this function use the menu *Utilities* - *Maps server*. To display the map, type the location (e.g.: Via Roma, 45 Milano).
Alternately you can input the geographical coordinates of the center of the map; this can be done:

- Manually specifying the coordinates in the formats:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant

- Selecting the coordinates through the button *Sel. coordinates*.
- Using the *Paste* function of the context menu of the box coordinates (before you must have copied the point coordinates on a map with the context menu or you must have copied the coordinates from another coordinates box).

You can select:

- The map type
- One or more overlays
- The zoom level (0-20)
- The image size in pixel to produce

Then press the *Get image* button.

You can choose if produce a grayscale image (less memory usage).

To save the map image and its calibration file for OkMap (.okm), press the *Save map* button.

## Geocoding

It's a function that can determine the geographical coordinates based on a specific street address.

To activate this function use the menu *Utilities - Geocoding*.

To determine the locations and their geographic coordinates enter in the above field the address (e.g.: Via Roma, 45 Milano) and press enter or the *Geocoding* button.

Clicking on *Rev. Geocod.* button you get the reverse calculation.

To compute a reverse calculation it's necessary to input the coordinates; this can be done:

- Manually specifying the coordinates in the formats:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant

- Selecting the coordinates through the button *Sel. coordinates*.
- Using the *Paste* function of the context menu of the box coordinates (before you must have copied the point coordinates on a map with the context menu or you must have copied the coordinates from another coordinates box).

## Routing

It's a function that can determine the shortest or fastest route between two locations.

To activate this function use the menu *Utilities - Routing*.

To determine the track enter the start and the end addresses (e.g.: Via Roma, 45 Milano) and press enter or the *Calculate* button.
Alternatively you can type the coordinates of the start and end places; this can be done:

- Manually specifying the coordinates in the formats:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant

- Selecting the coordinates through the button *Sel. coordinates*.
- Using the *Paste* function of the context menu of the box coordinates (before you must have copied the point coordinates on a map with the context menu or you must have copied the coordinates from another coordinates box).

You can customize:

- Transport type (motorcar, bicycle, walking)
- Fastest or shortest route

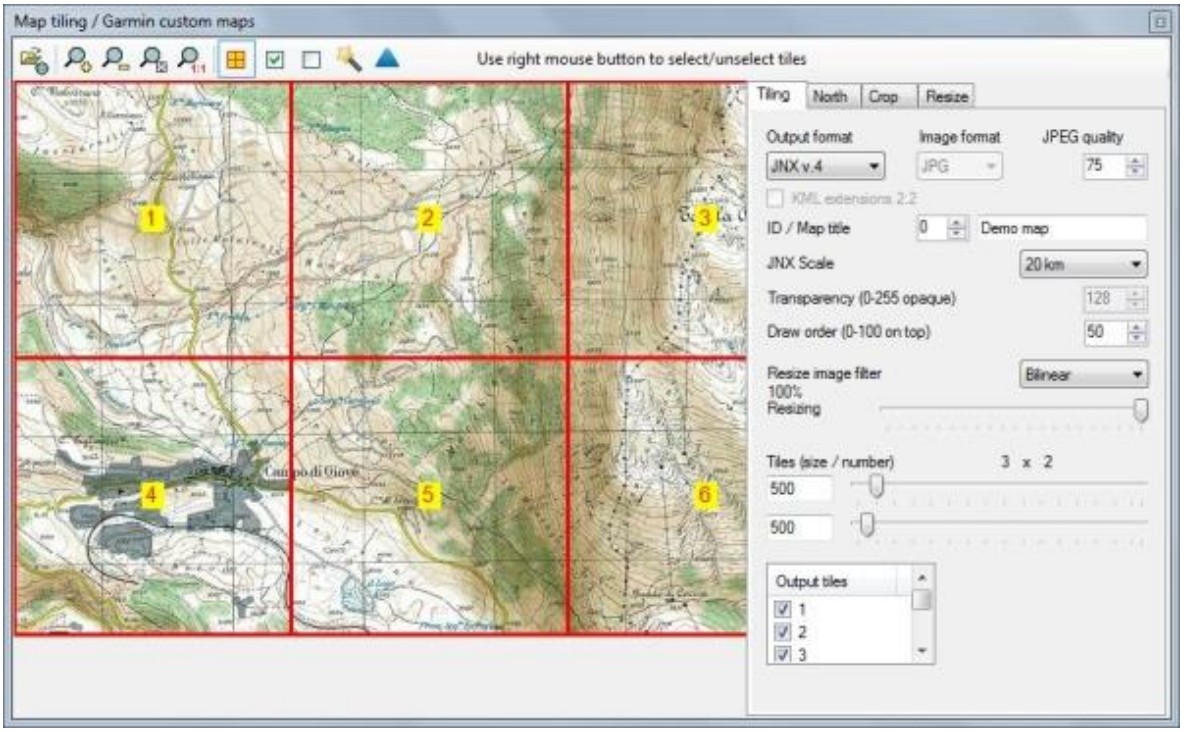
Calculated track can be saved by pressing the *Save track* button; the name must be typed in the beside box.

## Map tiling / Garmin custom maps

It 's a function that can subdivide a map orthogonally in smaller maps.

Is particularly useful for creating maps compatible with some handheld GPS such as Garmin.

A video is available for this function.




To activate this function use the menu *Utility - Map tiling*.

Map zooming and panning functions are similar to those of display map window.

You can customize:

- The output format (KML, KMZ, JNX v.3, JNX v.4, OruxMaps, OkMap)
- The format of the output images (JPG, TIF, PNG, GIF, BMP)
- The quality of the output JPEG images (0=Bad, 100=Good)
- The use of extensions kml 2.2 (only for OkMap version)
- The ID and the map title (only for JNX)
- The JNX scale (only for JNX)
- The KML transparency (0=Transparent, 255=Opaque)
- The KML draw order (0=Invisible, 1-49=Under the vectorial data, 50-100=On the top)
- The image filter to be used in resizing functions
- The percentage of resizing of the images to generate
- The size (width and height) of the tiles you want generate or customize the number of horizontal and vertical tiles number by scrollbars
- The sub maps you want to generate (using the right mouse button also)

The button *Optimize* automatically sets the best settings to generate the "Garmin
Custom Maps".

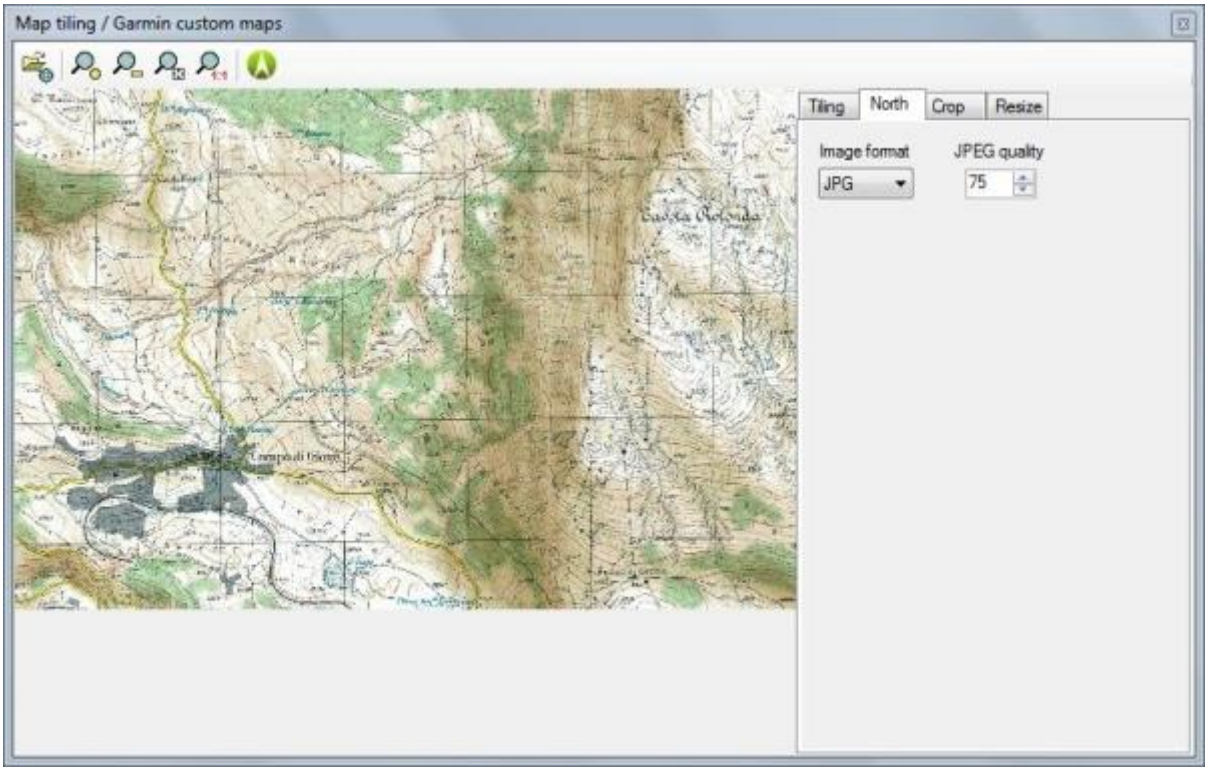
The button *Create a north oriented map* creates a new OkMap map aligned to true north (usefull to create JNX format maps).

To select all the maps press the button *Select all*.
Similarly to unselect all the maps press the button *Unselect all*.

To activate the generation press the button *Generate* .
While processing a progress bar will show the state of execution. To abort the generation press the *Cancel* button.

## Orient a map to north

It's a function that creates a new map oriented to north.



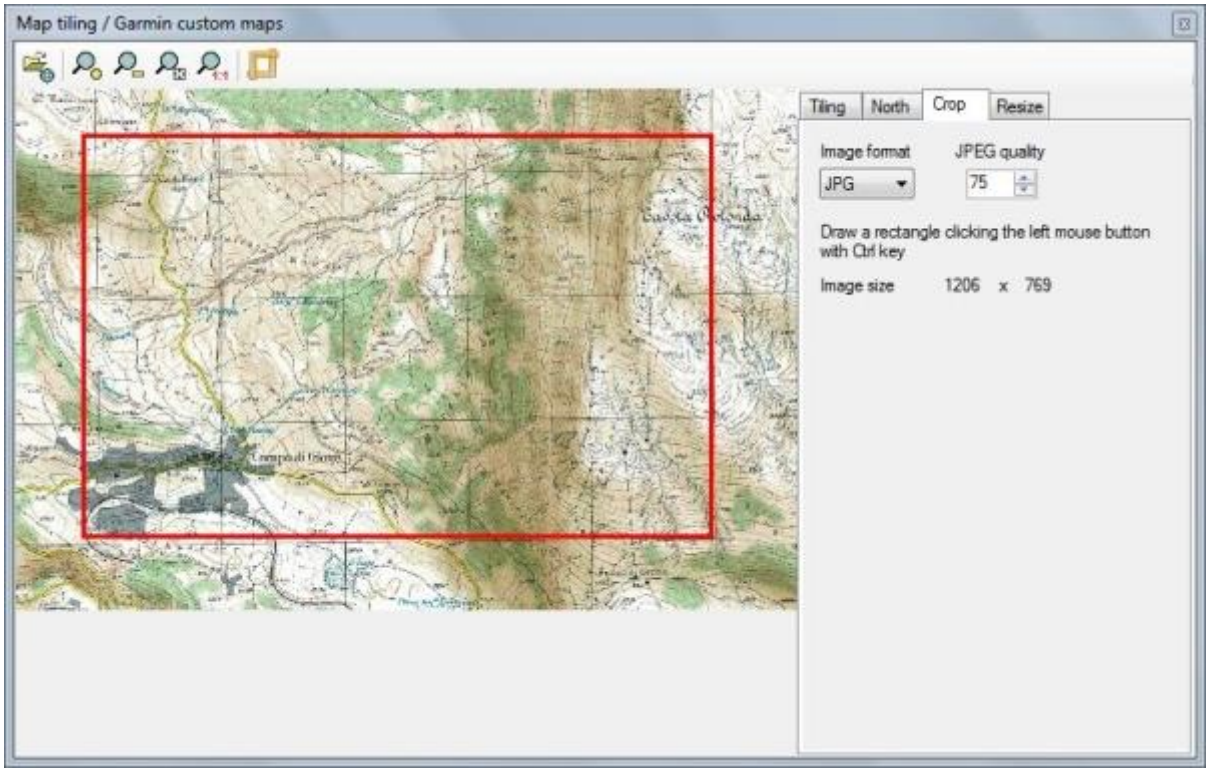

You can customize:

- The quality of the output JPEG images (0=Bad, 100=Good)

To activate the function press the button *Create a north oriented map* .

## Crop a map

It's a function that creates a new cropped map.




You can customize:

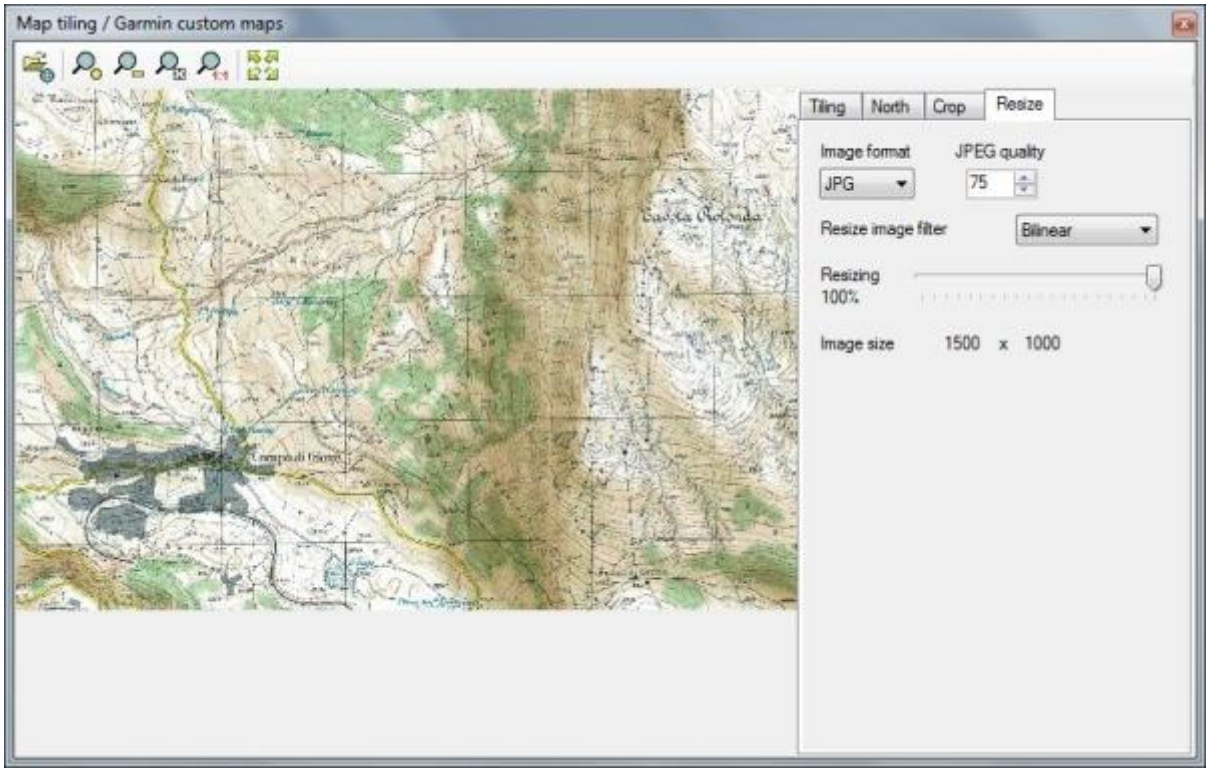
- The format of the output images (JPG, TIF, PNG, GIF, BMP)
- The quality of the output JPEG images (0=Bad, 100=Good)

To specify the size of the new map, draw a rectangle with the left mouse button and Ctrl key.

To activate the function press the button *Create a cropped map* .

## Resize a map

It's a function that creates a new resized map.




You can customize:

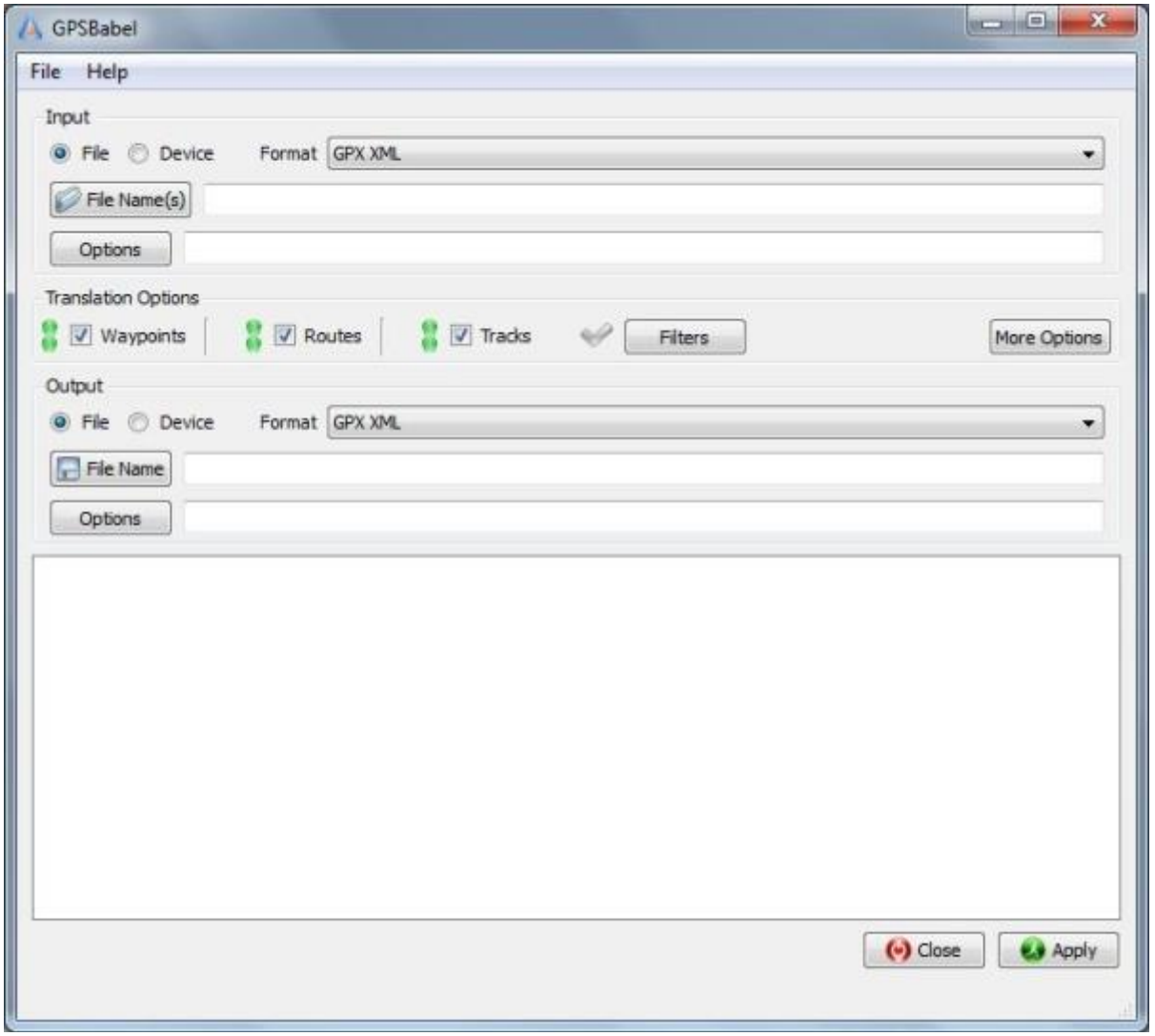
- The format of the output images (JPG, TIF, PNG, GIF, BMP)
- The quality of the output JPEG images (0=Bad, 100=Good)
- The image filter to be used in resizing function
- The percentage of resizing of the map image to create

To activate the function press the button *Create a resized map* .

## GPSBabel converter

Provides a multitude of GPX data conversion functions from one format to another.

To activate this function use the menu *Utilities - GPSBabel converter*.
The following window is displayed.




This function has its own help that can be displayed using the menu *Help - GPSBabel Help*.

For more information, visit GPSbabel.org.

## Xslt transformations

Provides a multitude of functions for converting xml data from one format to another, thanks to the method of XSLT transformations.

For more information, visit XSL Transformations (XSLT).

To activate this function use the menu *Utilities - Xslt transformations*.
The following window is displayed.

Indicate the input, processing xslt and output file in the appropriate fields, then press the *Transform* button.

Use the buttons with the dots to open the dialog box for selecting files. The *Close* button closes the window.

## Calculator

This is a handy calculator to use for our calculations.

To activate this function use the menu *Utilities* - *Calculator*.
The following window is displayed.

To make a calculation, write your mathematical formula in the field above and press the *Evaluate* button; the result will appear in the field below.

Use the *Help* button to display a window containing all the constants, the functions and the operators used in our calculations.

The constants, functions and operators are grouped into categories that can be opened / closed by clicking on the respective symbols + and -.

The elementary items are shown in our formula, in the current position of the cursor, clicking on them with the left mouse button.

Several levels of parentheses are also allowed. The *Close* button closes the window.

## Create toponyms

Provides a function to convert some formats of data to toponyms.

To activate this function use the menu *Utilities* - *Create toponyms*.
The following window is displayed.

Select the input format choosing one of the following:

- GPX
- Garmin custom POI (csv)
- OziExplorer Name Search
- ESRI shape

Then press the *Create* button.

Opens a dialog box that allows you to open one or more input files.

If you choose the ESRI shape, the process involves the acquisition of further information; this is similar to the function Import SHP vectorial data.

After converting operations, opens a dialog box to save all the toponyms in one file with extension .top.

The *Close* button closes the window.

## Create photo list

It provides a function to create a list of georeferenced photos to be displayed on maps.

To activate this feature using the menu *Utilities - Create photo list*.
The following window is displayed.

Choose the folder where photos are stored and eventually select the *Include subfolders* option.

Then choose the output file; if you select *Append* option, the data will be appended to any existing file.

Then press the button *Create*. A bar shows the progress of processing.

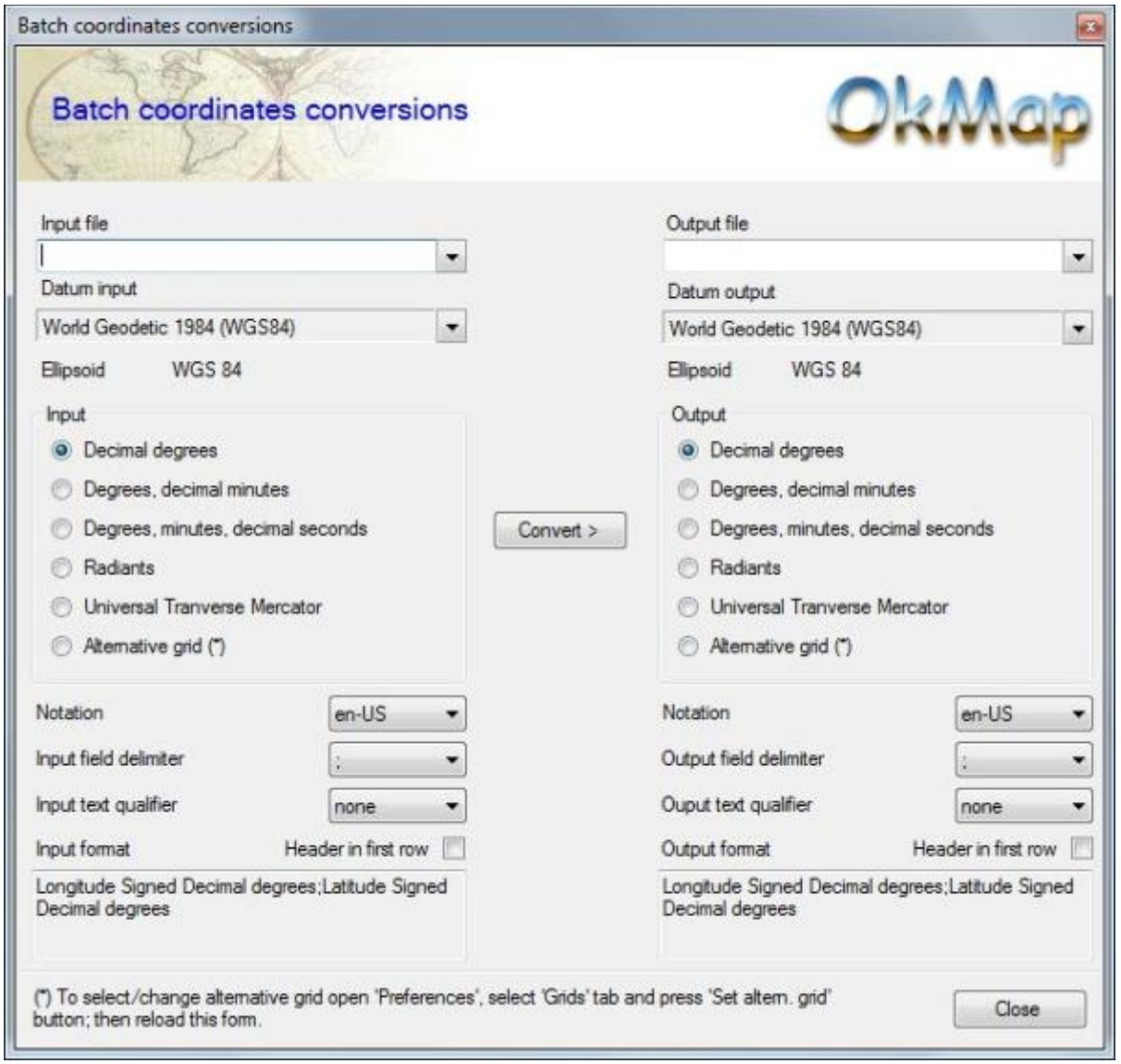
The *Close* button closes the window.

## Batch conversions of coordinates

This function is used to converts coordinates from one datum to another and from one format to another.

The coordinate pairs are stored in an input csv format file (comma separated value); an output csv file is produced according to the provided specifications.

To activate the function use the menu *Utilities - Batch coord. conversions*.




Select the input and output file.

Select the datum of origin and destination.

The list shows only the active datum. To enable or disable one or more datum to use the List - Datum function.

Then enter the coordinates of origin and destination; you can choose their mode of representation, selecting:

- Degrees - coordinates expressed in decimal degrees
- GMM - coordinates expressed in degrees and decimal minutes
- GMS - coordinates expressed in degrees, minutes and decimal seconds UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
- Rad - expressed in decimal radiant
- Alt - coordinates provided as specified in the Preferences - Grids ("Set altern. grid" button)

Then select the format of origin and destination coordinates:

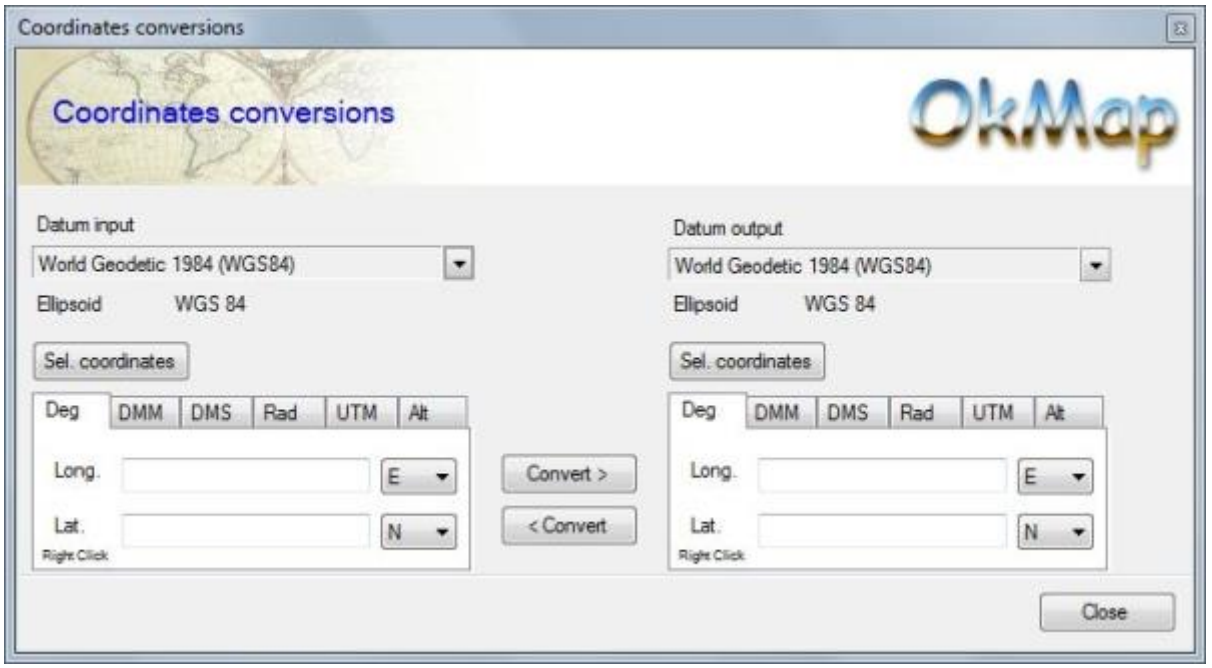
- Numeric fields notation
- Fields delimiter
- Text qualifier
- Presence or absence of an header row

An example of the input and output format is displayed. To convert press the *Convert* > button.

## Conversions of coordinates

This function is used to converts coordinates from one datum to another.

To activate the function use the menu *Utilities* - *Coord. conversions*.




Select the datum of origin and destination.

The list shows only the active datum. To enable or disable one or more datum to use the List - Datum function.

Then enter the coordinates of origin; this can be done:

- Manually specifying the coordinates in the formats:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant

- Selecting the coordinates through the button *Sel. coordinates*.
- Using the *Paste* function of the context menu of the box coordinates (before you must have copied the point coordinates on a map with the context menu or you must have copied the coordinates from another coordinates box).

To convert press the *Convert* > button.

You can make the reverse conversion by pressing the < *Convert* button.

Calculated coordinates can be stored in a waypoint by pressing the *Save waypt* button; the name must be typed in the beside box.

## Distances and azimuth calculations

This function is used to:

- given two geographical points, to calculate distance and azimuth
- given a geographical location, distance and an azimuth, to calculate a second geographic point

To activate the function use the menu *Utilities - Distances, azimuth*.

Select the reference datum.

The list shows only the active datum. To enable or disable one or more datum to use the List - Datum function.

Then enter the coordinates of origin; this can be done:

- Manually specifying the coordinates in the formats:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant

- Selecting the coordinates through the button *Sel. coordinates*.
- Using the *Paste* function of the context menu of the box coordinates (before you must have copied the point coordinates on a map with the context menu or you must have copied the coordinates from another coordinates box).

Then, similarly, choose the coordinates of destination. To calculate press the *Compute V* button.
You can calculate the second geographical coordinate from the first, distance and azimuth pressing the ^ *Compute* button.

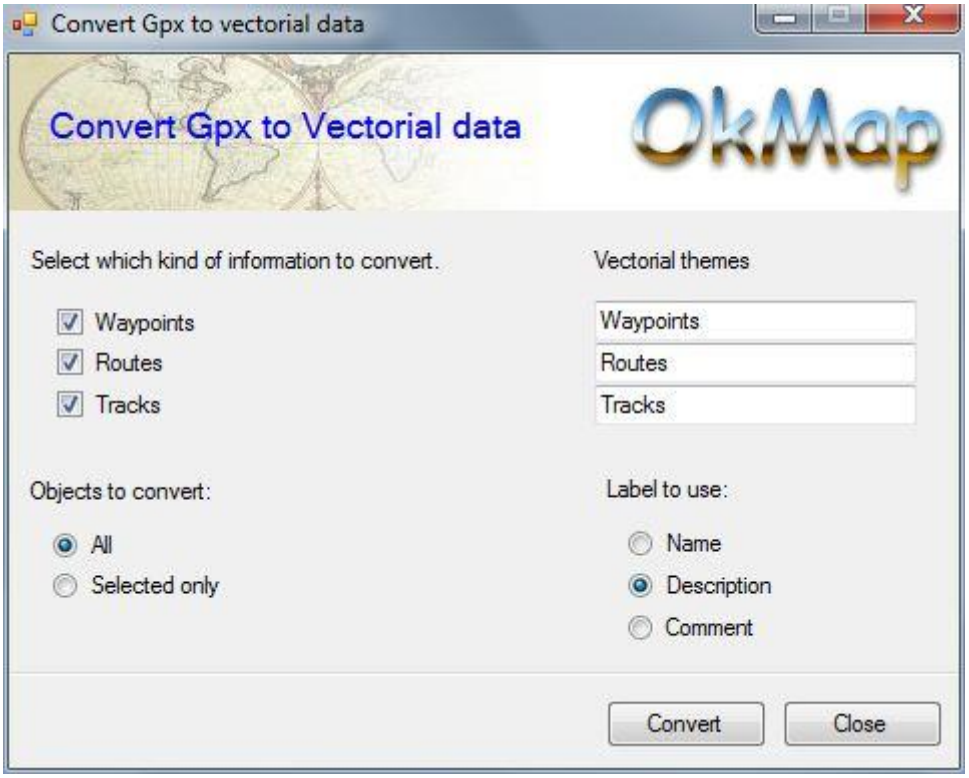
Calculated coordinates can be stored in a waypoint by pressing the *Save waypt* button; the name must be typed in the beside box.

## Convert vectorial data to GPX

This function is to convert vectorial data to GPX data.

The points and the multipoints are converted into waypoint; the lines and the polygons into routes or tracks, chosen by the user.

To activate the function use the menu *Data - Convert vectorial to GPX data*.




Select the types of vectorial data that you want to convert (points, multipoints, lines e/o polygons).

Choose if you want to convert all vectorial data, those related to selected themes, or only the selected shape.

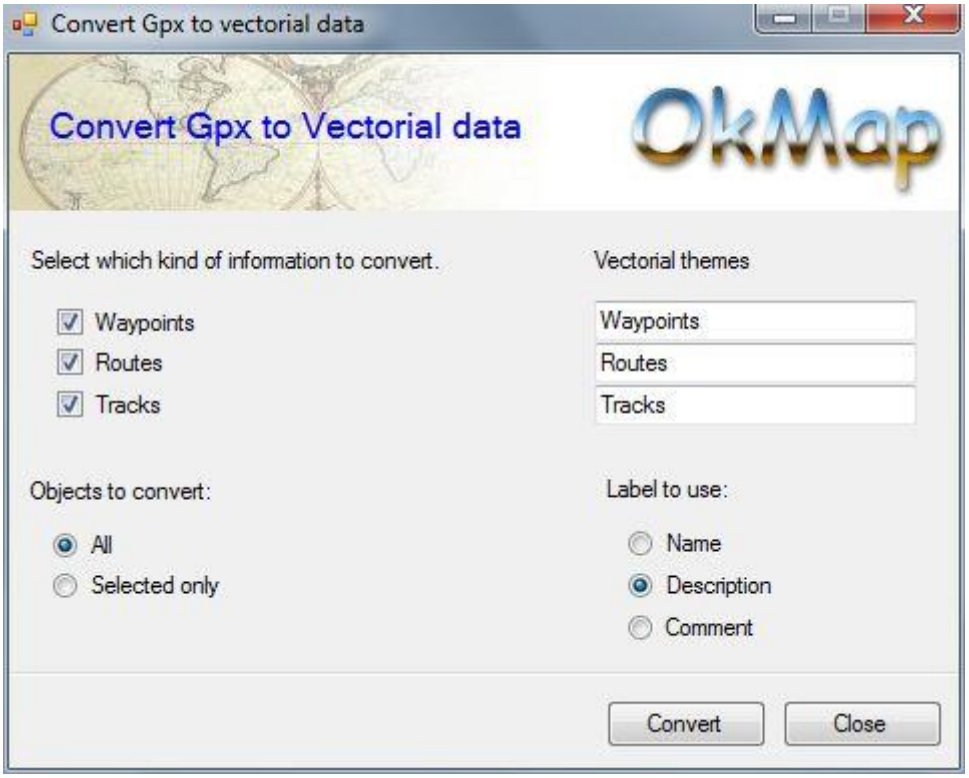
Choose whether you want to convert lines and polygons in routes or tracks. To make the conversion press the *Convert* button.

## Convert GPX to vectorial data

This function is to convert GPX data to vectorial data.

The waypoints are converted into points; the routes and the tracks into lines.

To activate the function use the menu *Data - Convert GPX to vectorial data*.




Select the types of GPX data that you want to convert (waypoints, routes and / or tracks) and possibly change the name of the theme proposed in the adjacent box.

If the themes do not exist they are automatically created; you can then change their properties with the function List – Vectorial themes.

Choose if you want to convert all data GPX or only selected ones.

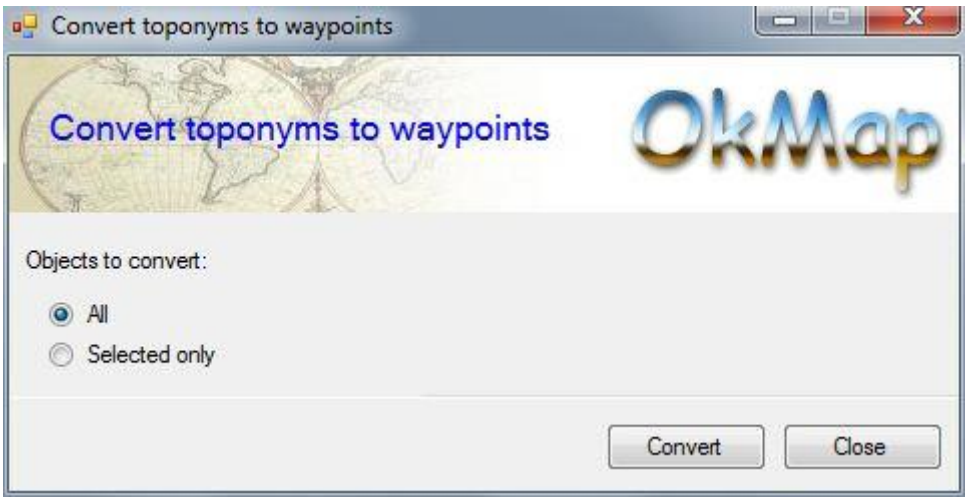
Choose which information will be used as label of the vectorial data (name, description or comment).

To make the conversion press the *Convert* button.

## Convert toponyms to waypoints

This function is to convert toponyms to waypoints.

To activate the function use the menu *Data* - *Convert toponyms to waypoints*.




Choose if you want to convert all toponyms or only the selected ones.

To make the conversion press the *Convert* button.

## Convert waypoints to toponyms

This function is to convert waypoints to toponyms.

To activate the function use the menu *Data* - *Convert waypoints to toponyms*.

Choose if you want to convert all waypoints or only selected ones.

Choose which information will be used as label of the toponyms (name, description or comment).

To make the conversion press the *Convert* button.

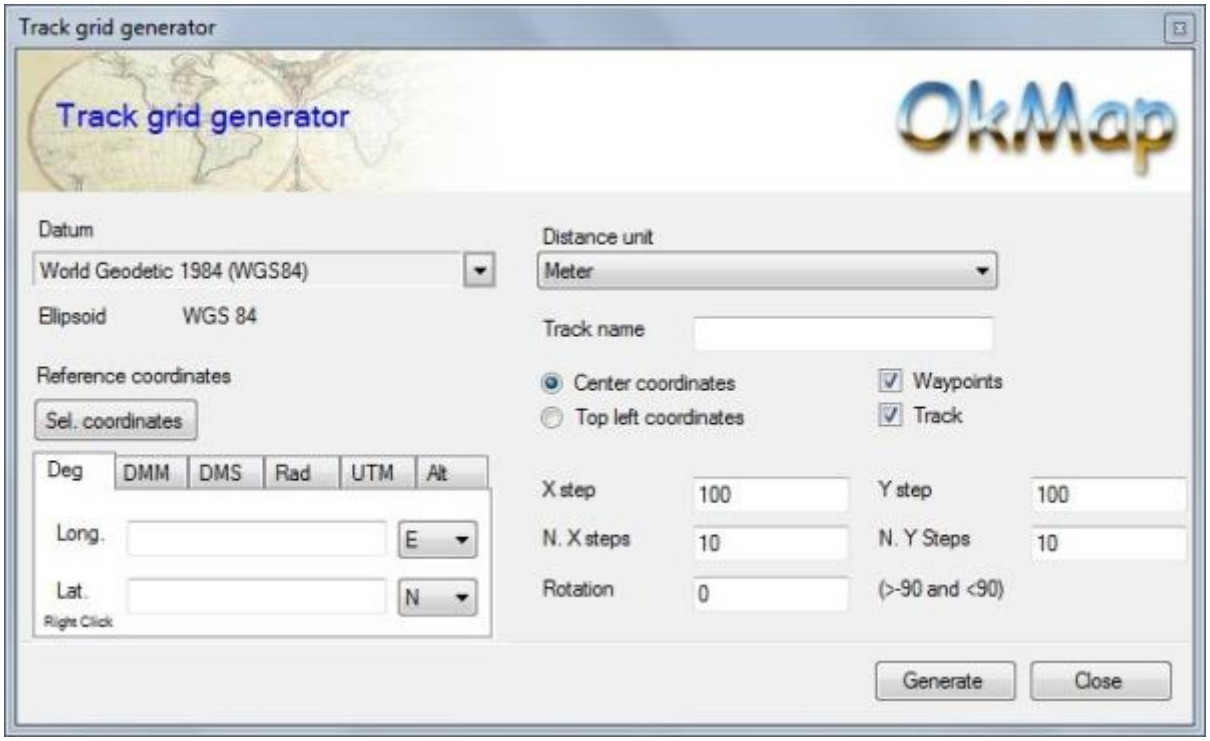
## Grid tracks generator

This function is to create a matrix of cells organized in GPX track with the correspondent waypoints to the center of every cell.

It's particularly useful for divide the land into zones; these zones (cells) can be assigned to different teams to use, for example, to search for people in difficulty.

To each team is assigned an area (marked by waypoints office) and upload their GPX with the GPX data generated by this function; so we will have the certainty that each team does not get into areas assigned to other teams and especially that each team covering your area completely.

To activate the function use the menu *Data* - *Track grid generator*.




Select the reference datum.

The list shows only the active datum. To enable or disable one or more datum to use the List - Datum function.

Then select the unit of measurement for distances.
Enter the name of the track which will also be the prefix of the generated waypoints. Indicate whether the coordinates given refer to the center of the grid or to the top left geographical point of the grid.

Specify if you want to generate only the grid and / or waypoints.

Then enter the reference coordinates (central point of top left point); this can be done:

- Manually specifying the coordinates in the formats:
  - Degrees - coordinates expressed in decimal degrees
  - GMM - coordinates expressed in degrees and decimal minutes
  - GMS - coordinates expressed in degrees, minutes and decimal seconds
  - UTM - coordinate expressed in UTM (east, north, zone and hemisphere)
  - Rad - expressed in decimal radiant

- Selecting the coordinates through the button *Sel. coordinates*.
- Using the *Paste* function of the context menu of the box coordinates (before you must have copied the point coordinates on a map with the context menu or you must have copied the coordinates from another coordinates box).

Specify the distance to be used for each cell in the X and Y axis.

Then indicate the number of cells (steps) that you want to generate in the X and Y directions.

Finally specify the angle of rotation of the whole matrix in degrees (> -90 and < 90). To generate press the *Generate* button.

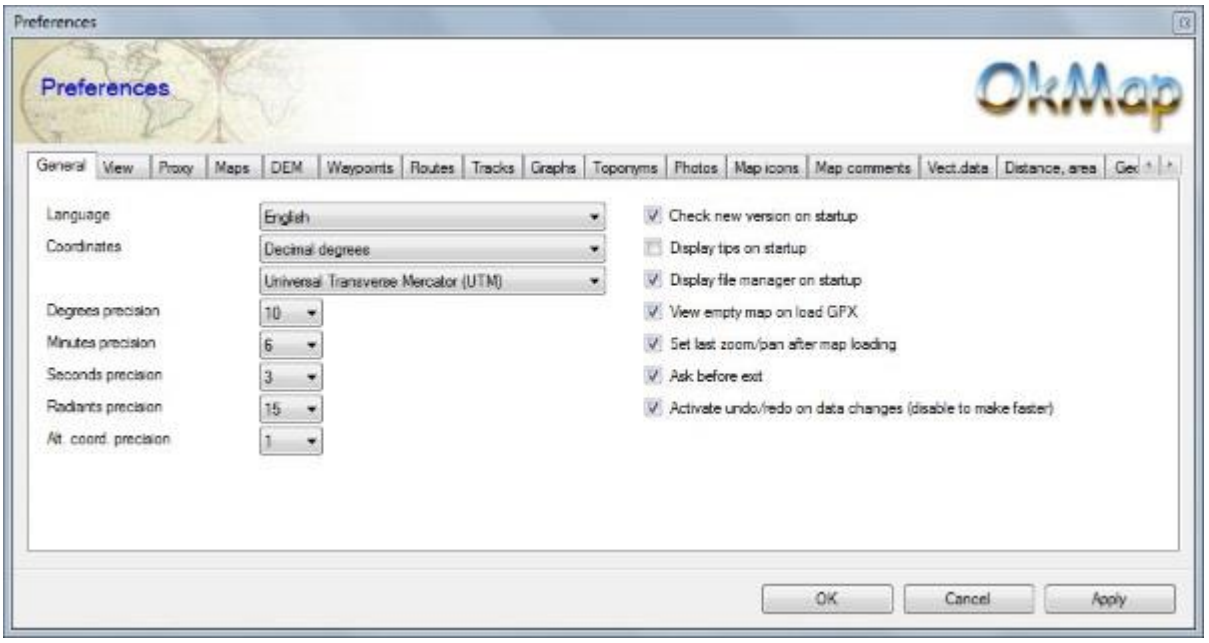
# Preferences

## Preferences - General

It's used to customize the OkMap favorite settings, in particular, this refers to the general settings page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *General*.

The following window is displayed.




In this window you can customize:

- Language: is the language used in the interface and changing this information involves the closing and reopening of OkMap.
- Coordinates: is how to represent the coordinates displayed in the status bar (2 selections)
- Degrees precision: it is the number of decimal places (precision) with which the value degrees are displayed in the coordinates.
- Minutes precision: it is the number of decimal places (precision) with which the value minutes are displayed in the coordinates.
- Seconds precision: it is the number of decimal places (precision) with which the value seconds are displayed in the coordinates.
- Radiant precision: it is the number of decimal places (precision) with which the radiant coordinates are displayed.
- Alt .coord. precision: it is the number of decimal places (precision) with which the east value and north are displayed in the alternative coordinates.
- Check new version on startup: If checked, after starting OkMap checks if a newer version is available and in this case opens a window in the lower right to make the download.
- Display tips on startup: If checked, after starting OkMap automatically opens the tips window.
- View empty map on load GPX: If checked, after GPX data loading and if is not open a window map, OkMap automatically opens a blank map window ready for use.
- Set last pan/zoom after map loading: If checked, after loading a map, sets map zoom and map pan to the last settings.
- Ask before exit: if checked, OkMap asks for confirmation before closing.
- Activate Undo/Redo on GPX changes: enables the possibility to perform undo and redo changes on GPX data. This function can be disabled for faster GPX data

changes.

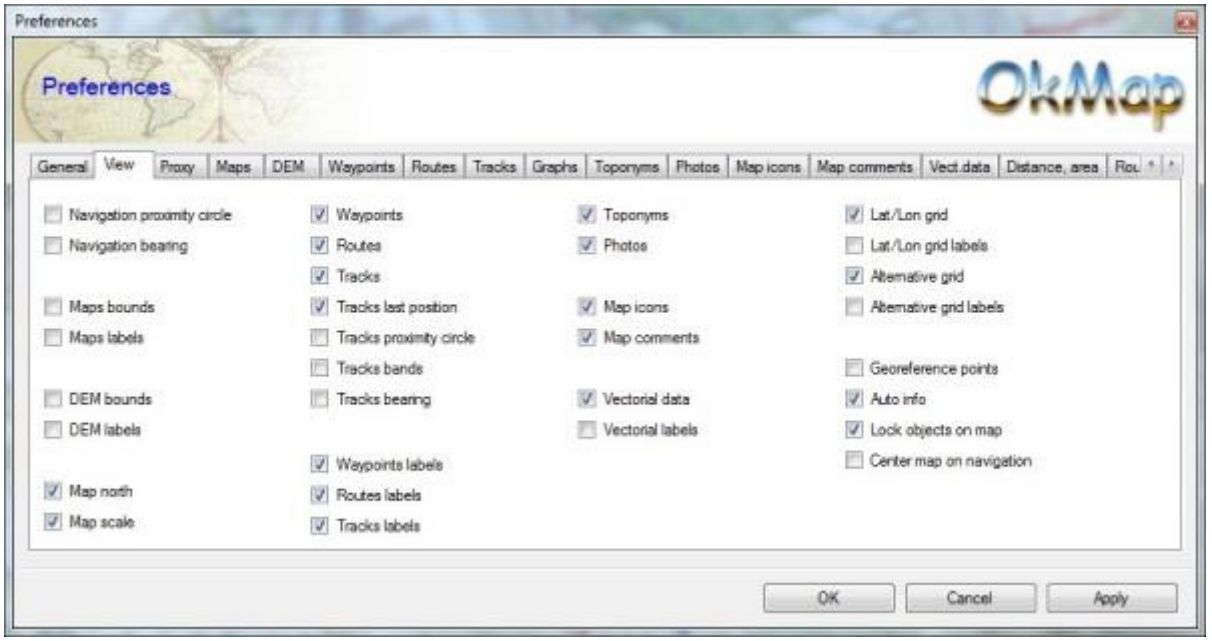
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - View

It's used to customize the OkMap favorite settings, in particular, this refers to the page of the default settings for the display of maps.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *View*.

The following window is displayed.




In this window you can customize the default options used in *View* menu.

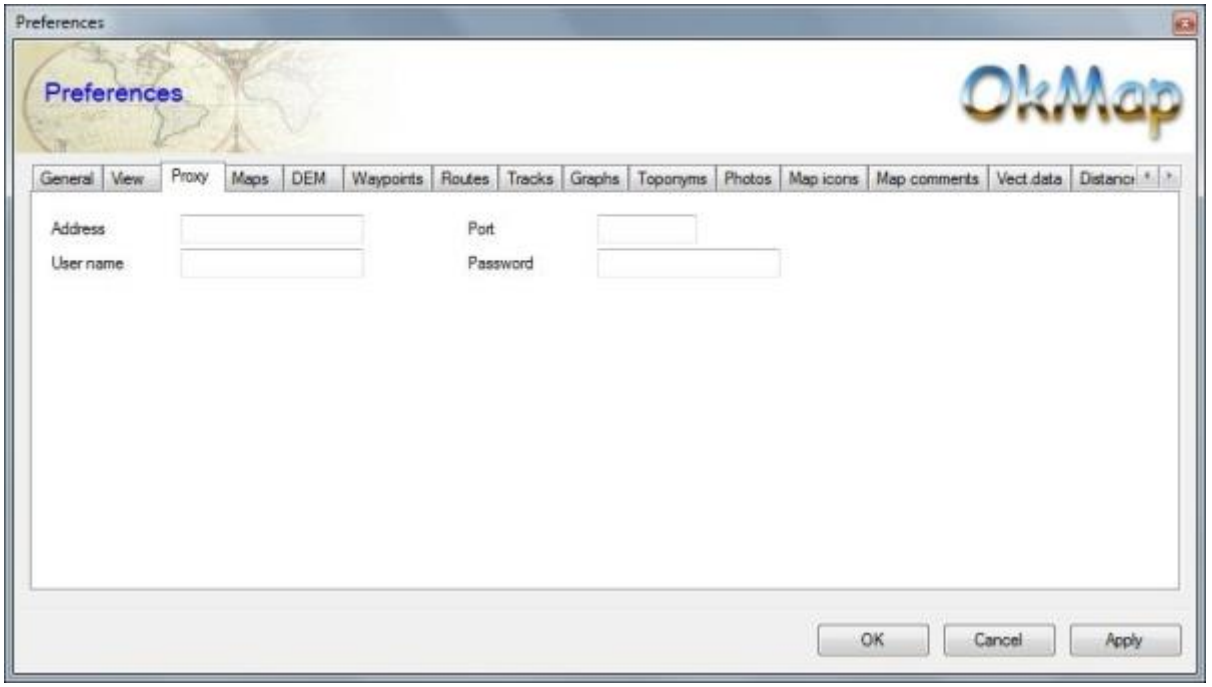
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Proxy

It's used to customize the OkMap favorite settings, in particular, this refers to the proxy server page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Proxy*.

The following window is displayed.




In this window you can customize:

- Address: it's the IP address of the proxy server.
- Port: It's the port of the proxy server.
- User name: it's the user name with which to log.
- Password: it's the password with which to log.

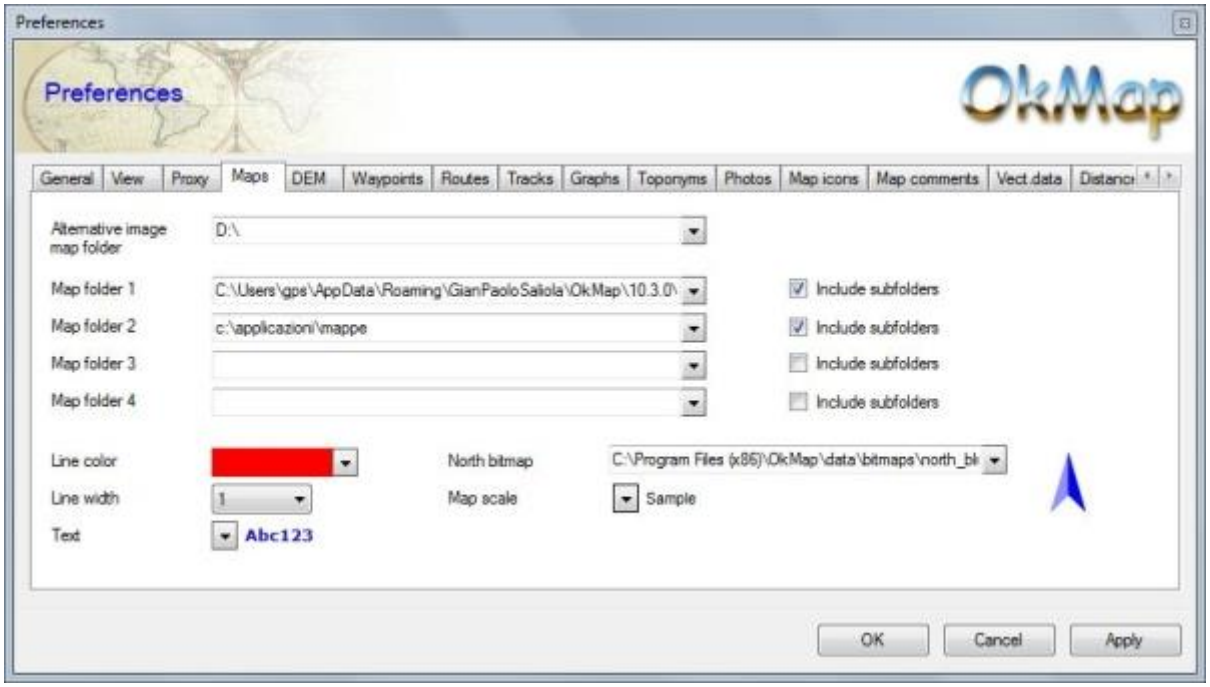
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Maps

It's used to customize the OkMap favorite settings, in particular, this refers to the processing and displaying maps settings page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Maps*.

The following window is displayed.




In this window you can customize:

- Alternative image map folder: it is the folder where OkMap looks for the map images during the loadingofamap, if these were not present in the same folder of the file map .okm.
- Map folder 1/4: is the path where OkMap search maps (file. OKM) to index (you can specify up to four different locations).
- Include subfolders: this must be activated if you want to search the maps to index in subfolders.
- Line color: it's the color used in the drawing of the maps bounds.
- Line width: it's the line thickness in pixel used in the drawing of maps bounds.
- Text: it's the font and the color used in the drawing of the maps bounds labels.
- North bitmap: It's the bitmap used on the map to display the compass needle pointing north.
- Map scale: it's the font and the color used in the drawing of the map scale.

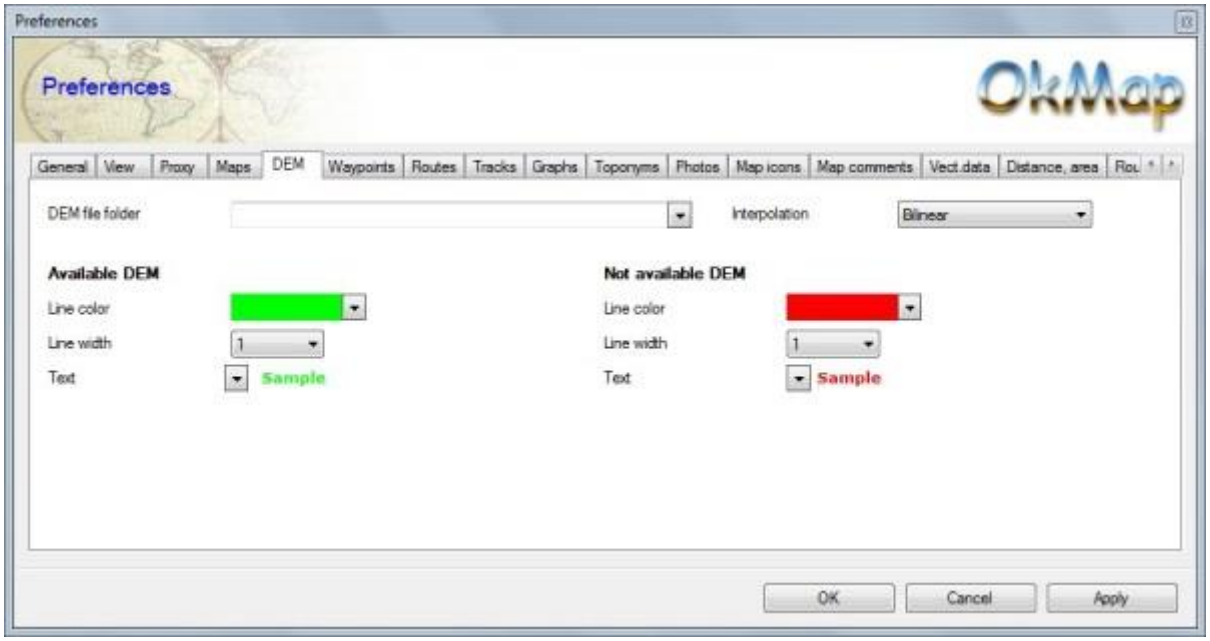
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - DEM

It's used to customize the OkMap favorite settings, in particular, this refers to the processing and displaying data DEM page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *DEM*.

The following window is displayed.




In this window you can customize:

- DEM file folder: is the folder where the DEM files are stored.
- Interpolation type: Level plane or Bilinear.
- Available DEM
  - Line color: it's the color used in drawing the bound of the available DEM data.
  - Line width: it's the line thickness in pixel used in drawing the bounds of available DEM data.
  - Text: it's the font and the color used in drawing the relative labels of the bounds of available DEM data.

- Non available DEM
  - Line color: it's the color used in drawing the bounds of the not available DEM data.
  - Line width: it's the line thickness in pixel used in drawing the bounds of the not available DEM data.
  - Text: it's the font and the color used in drawing the relative labels of the bounds of the not available DEM data.

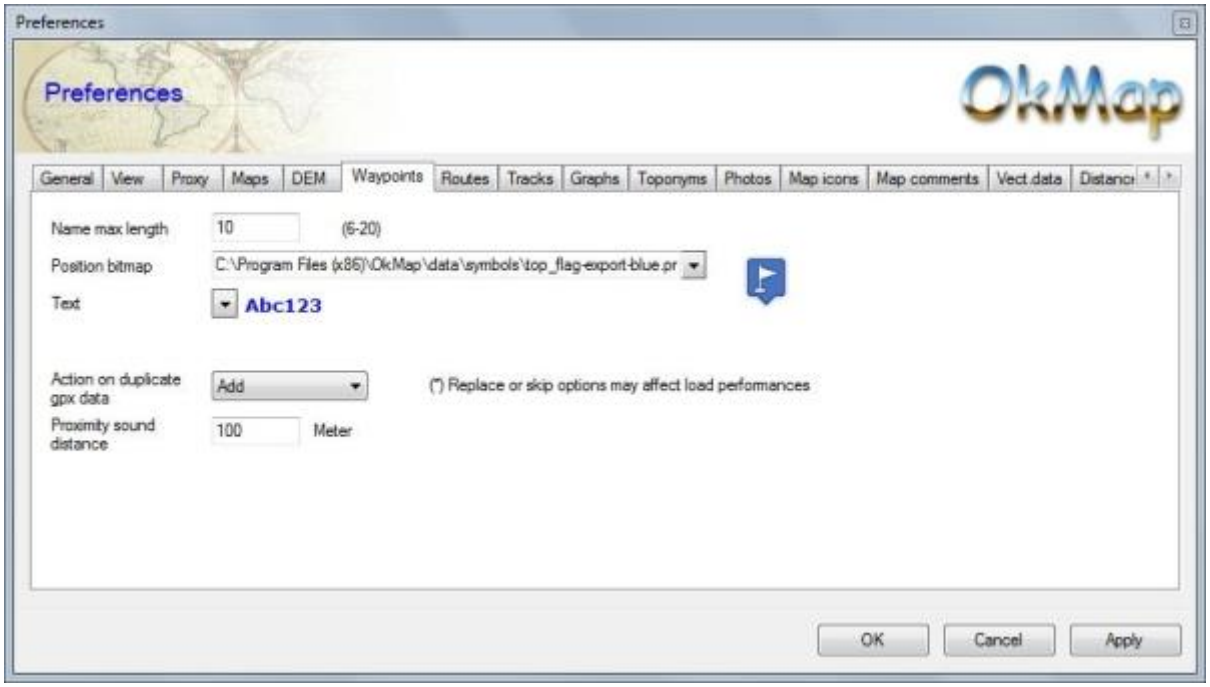
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Waypoints

It's used to customize the OkMap favorite settings, in particular, this refers to the processing and displaying waypoints page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Waypoint*.

The following window is displayed.




In this window you can customize:

- Name max length: it's the maximum length in characters used for names of the waypoints; it's used to ensure compatibility with the GPS used.
- Position bitmap: it's the name of the file bitmap to be used in drawing the waypoints.
- Text: it's the font and the color used in drawing the labels of the waypoints.
- Action on duplicated GPX data: is the action to take when you try to add a waypoint already exists in those loaded:
  - Add: an unique name is created for the new waypoint to be added.
  - Ignore: the duplicated waypoint is discarded.
  - Replace: the waypoint preserves the name and replace that the existing one.
- Proximity sound distance: is the distance from a waypoint within which you will hear an alert sound when you navigate toward a waypoint or navigate along a route.

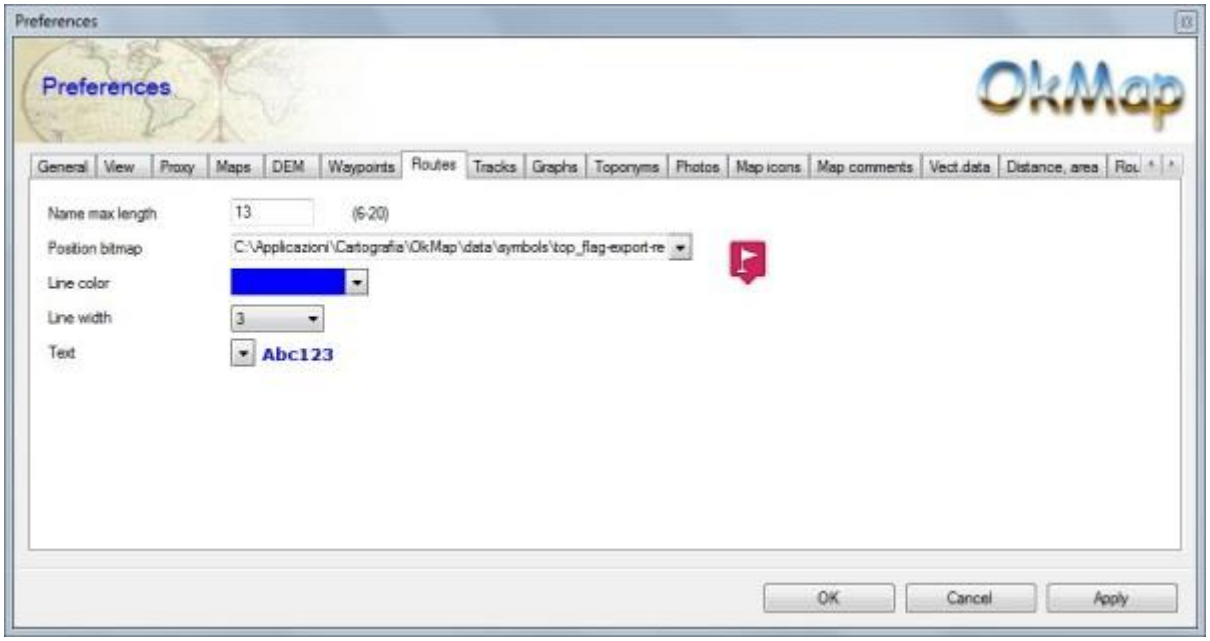
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Routes

It's used to customize the OkMap favorite settings, in particular, this refers to the processing and displaying routes page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Routes*

The following window is displayed.




In this window you can customize:

- Name max length: it's the maximum length in characters used for names of the routes; it's used to ensure compatibility with the GPS used.
- Position bitmap: it's the name of the file bitmap to be used in drawing the waypoints.
- Line color: it's the color used in the drawing the lines of the routes.
- Line width: it's the line width in pixel used in drawing the routes.
- Text: it's the font and the color used in drawing the labels of the routes.

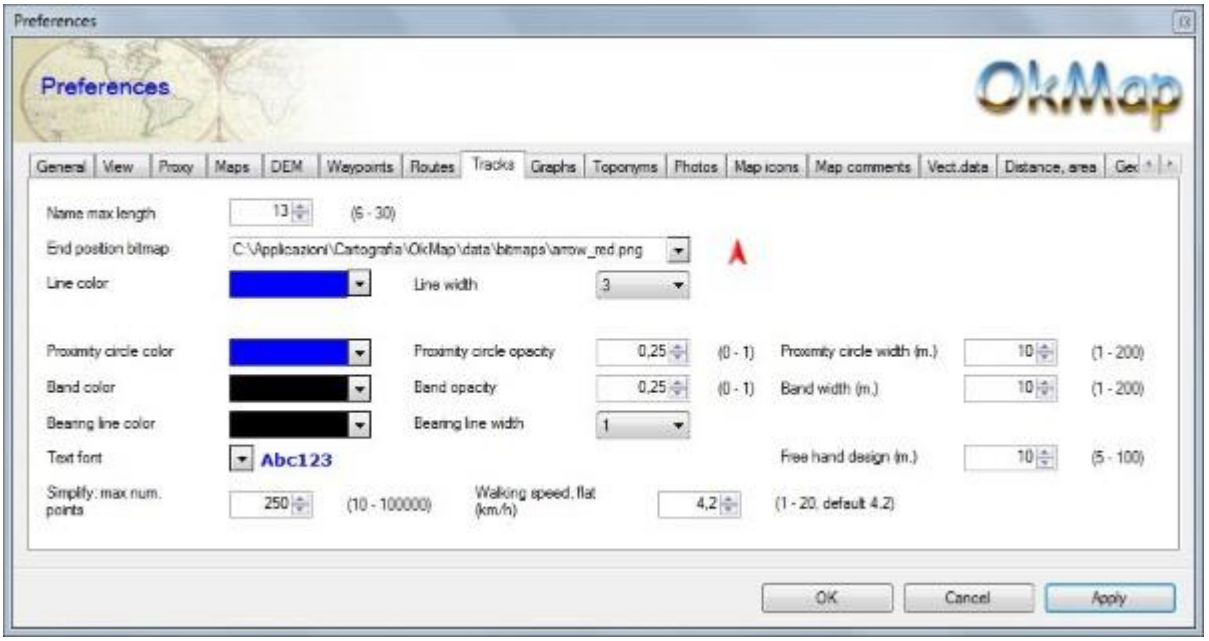
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Tracks

It's used to customize the OkMap favorite settings, in particular, this refers to the processing and displaying tracks page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Tracks*.

The following window is displayed.




In this window you can customize:

- Name max length: it's the maximum length in characters used for names of the tracks; it's used to ensure compatibility with the GPS used.
- End position bitmap: it's the name of the file bitmap to be used in drawing the final position of the tracks; this icon is useful to show where you can find the remote client when receiving remote data from OkMap or GpsGate.com.
- Line color: it's the color used in the drawing the lines of the tracks.
- Line width: it's the line width in pixel used in drawing the tracks.
- Proximity circle color: it's the color used in the drawing of the proximity circles of the tracks.
- Proximity circle opacity: it's the opacity of the color used in the drawing of the proximity circles of the tracks.
- Proximity circle width (m.): It's the thickness in meters of the proximity circles of the tracks
- Band color: it's the color used in the drawing of the bands of the tracks.
- Band opacity: it's the opacity of the color used in the drawing of the bands of the tracks.
- Band width (m.): It's the thickness in meters of the bands of the tracks
- Bearing line color: It's the color used in the drawing of the bearing line.
- Bearing line width: it's the line width in pixel used in the drawing of the bearing line of the track.
- Text: it's the font and the color used in drawing the labels of the tracks.
- Free hand design: it's the number of meters between points in a free hand track design.
- Simplify: max num. points: it's the maximum number of points of a track created by the simplify track function.
- Walking speed, flat (km/h): it's used to estimate the travel time.

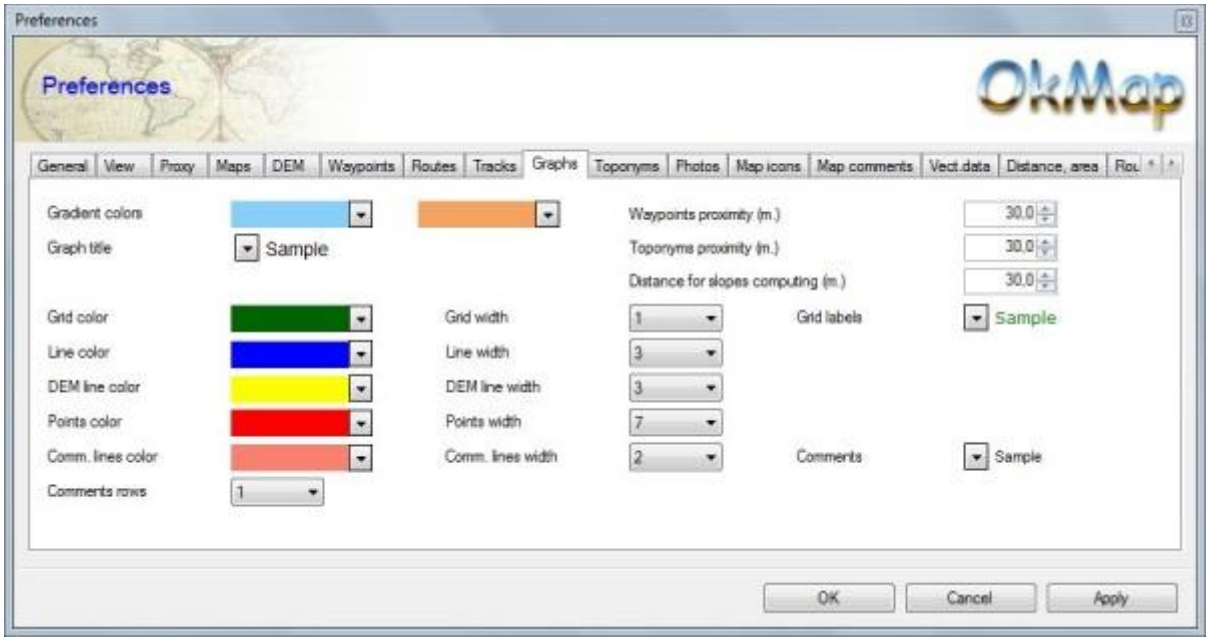
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences – Graphs

It's used to customize the OkMap favorite settings, in particular, this refers to the page of settings for displaying of graphics.

To activate this function use the menu Utilities - Preferences and open, clicking with the mouse, the section *Graphs*.

The following window is displayed.




In this window you can customize:

- Gradient colors: the gradient colors of the graph background.
- Graph title: it's the font and color of the graph title.
- Proximity distance for waypoints in meters
- Proximity distance for toponyms in meters
- Distance for slopes computing in meters
- Grid color: it's the color of the graph grid.
- Grid width: it's the thickness of the line of the graph grid.
- Grid labels: it's the font and color of the labels of the graph grid.
- Line color: it's the color of the main graph line.
- Line width: it's the thickness of the main graph line.
- DEM line color: it's the color of the DEM graph line.
- DEM line width: it's the thickness of the DEM graph line.
- Points color: it's the color used to draw the graph points.
- Points width: it's the size of the graph points.
- Comm. lines color: it's the color used to draw the comments lines (waypoints and toponyms).
- Comm. line width: it's the thickness of the comments lines.
- Comments: it's the font and color used for the comments descriptions.
- Comments rows: it's the number of rows used for comments descriptions.

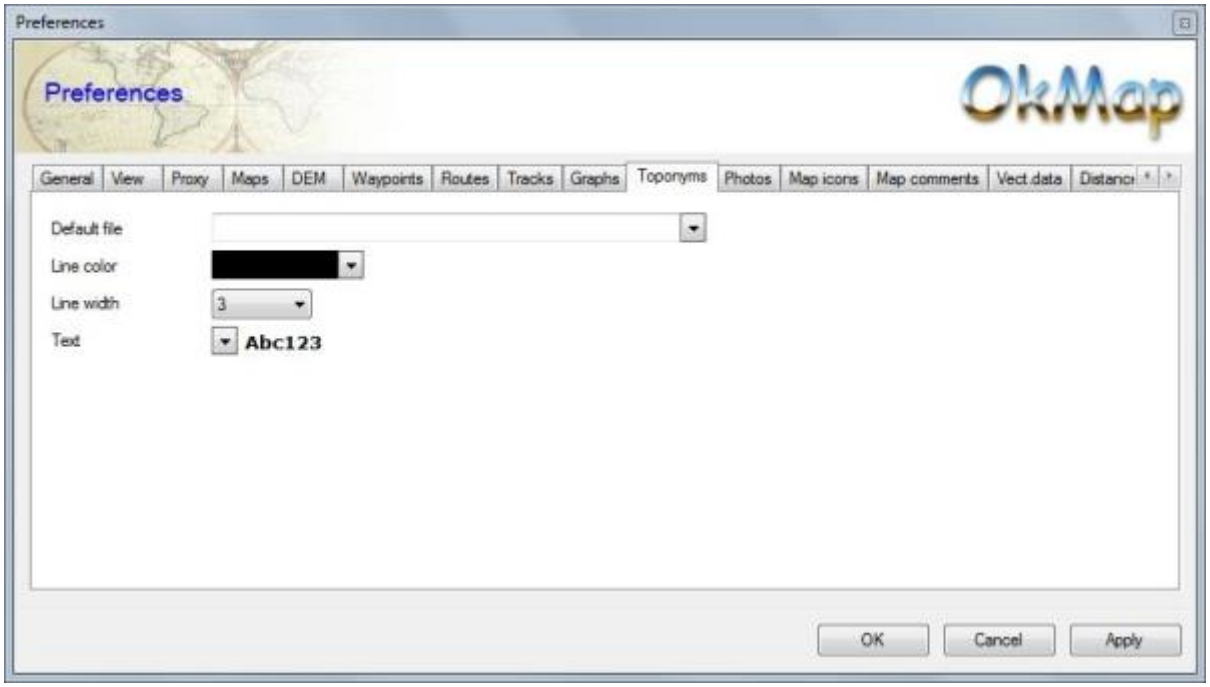
To save the modified data press the Apply button.
To save the changed data and exit function press the Ok button.
To exit without saving the data, press the Cancel button.

## Preferences – Toponyms

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying toponyms data page.

To activate this function use the menu Utilities - Preferences and open, clicking with the mouse, the section *Toponyms*.

The following window is displayed.




In this window you can customize:

- Default file: it's the name of the file which is automatically loaded at OkMap startup.
- Line color: it's the color used in drawing the toponyms points.
- Line width: it's the line thickness in pixel used in drawing the toponyms points.
- Text: it's the font and the color used in drawing the labels of the toponyms.

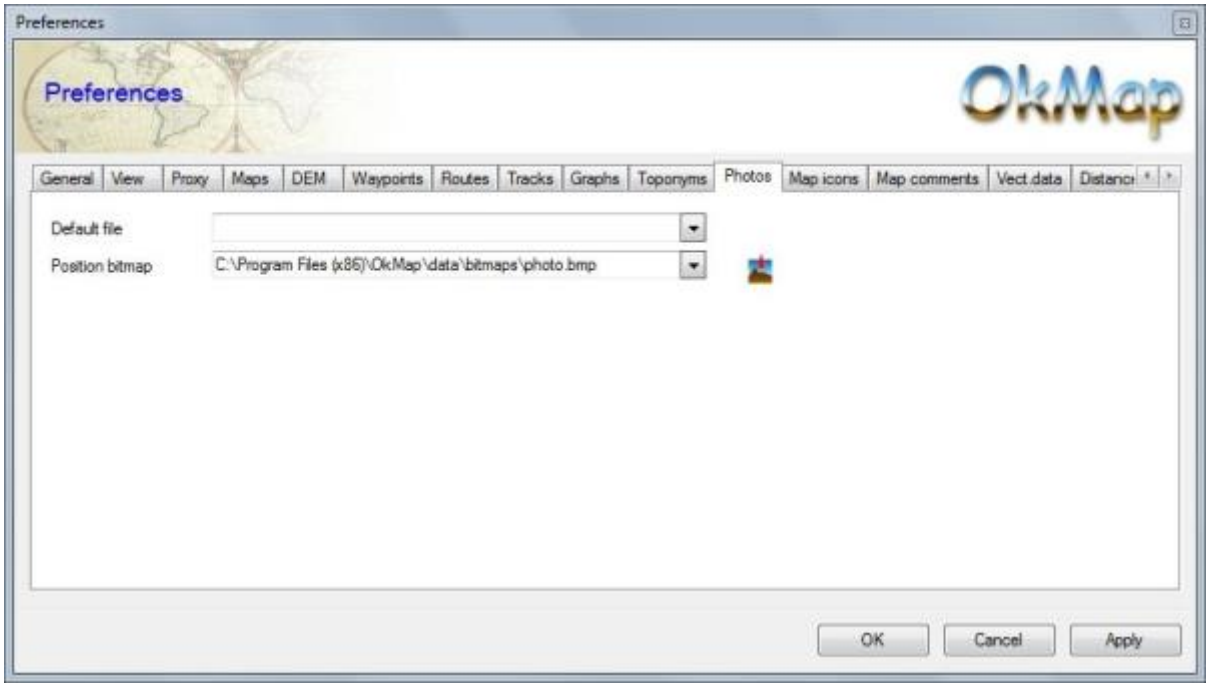
To save the modified data press the Apply button.
To save the changed data and exit function press the Ok button.
To exit without saving the data, press the Cancel button.

## Preferences – Photos

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying photos data page.

To activate this function use the menu Utilities - Preferences and open, clicking with the mouse, the section *Photos*.

The following window is displayed.




In this window you can customize:

- Default file: it's the name of the file which is automatically loaded at OkMap startup.
- Position bitmap: it's the name of the file bitmap to be used in drawing the photos.

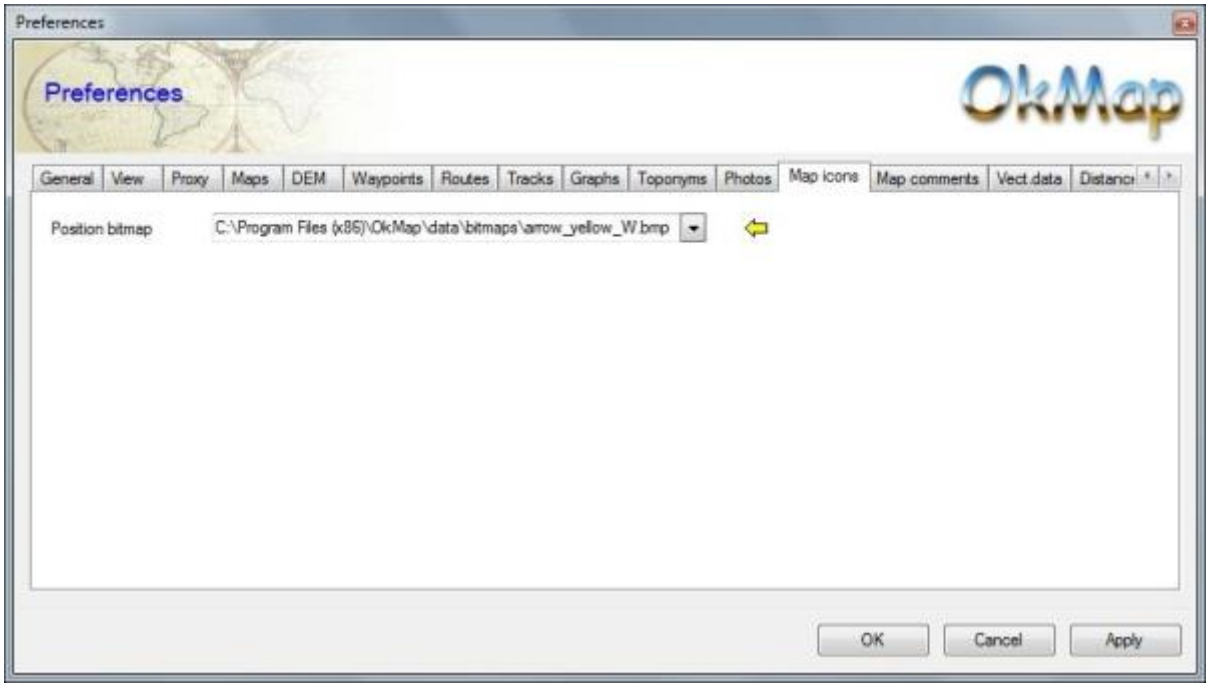
To save the modified data press the Apply button.
To save the changed data and exit function press the Ok button.
To exit without saving the data, press the Cancel button.

## Preferences - Map icons

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying map icons page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Map icons*.

The following window is displayed.




In this window you can customize:

- Position bitmap: it's the name of the file bitmap to be used in drawing the icons on the map.

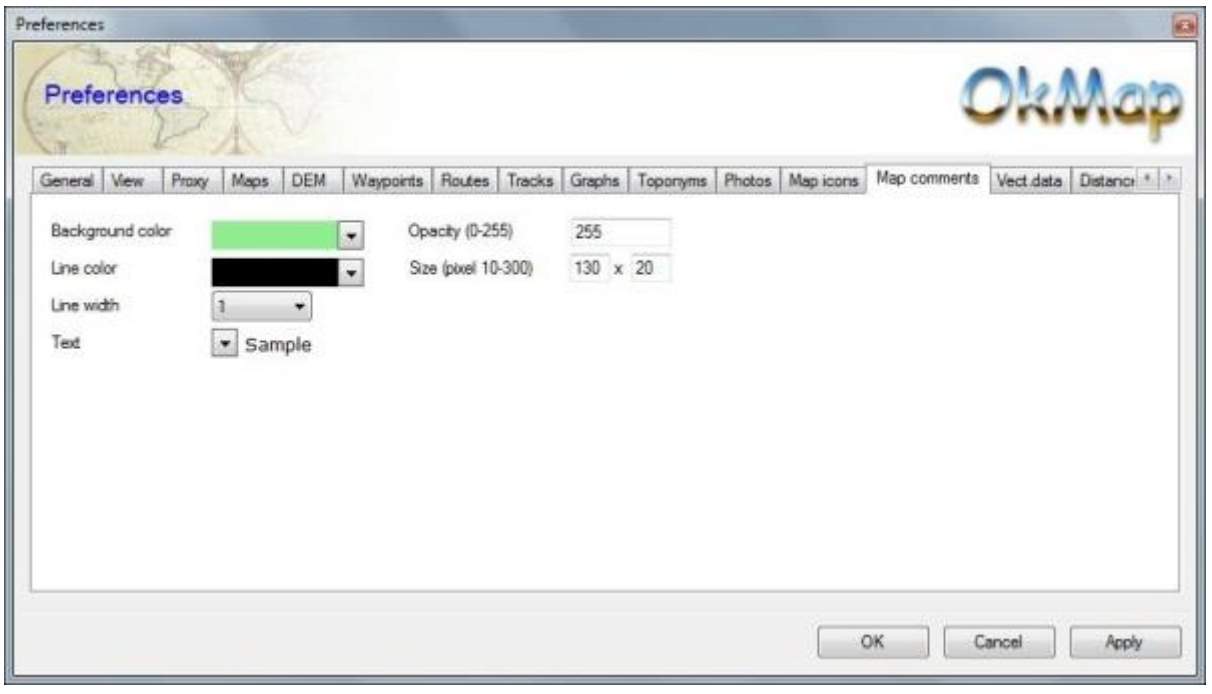
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Map comments

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying map comments page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Map comments*.

The following window is displayed.



In this window you can customize:

- Background color: it's the background color to be used in drawing the comments on the maps.
- Line color: it's the border color to be used in drawing the comments on the maps.
- Line width: it's the line width in pixels used in drawing the border of the comments on the maps.
- Text: it's the font and color used in drawing the text of the comments on the maps.
- Opacity: is the opacity factor used in drawing the text of the comments on the maps. The value ranges from 0 (transparent) to 255 (fully opaque).
- Size: it's the pixel size of the external frame (width and height).

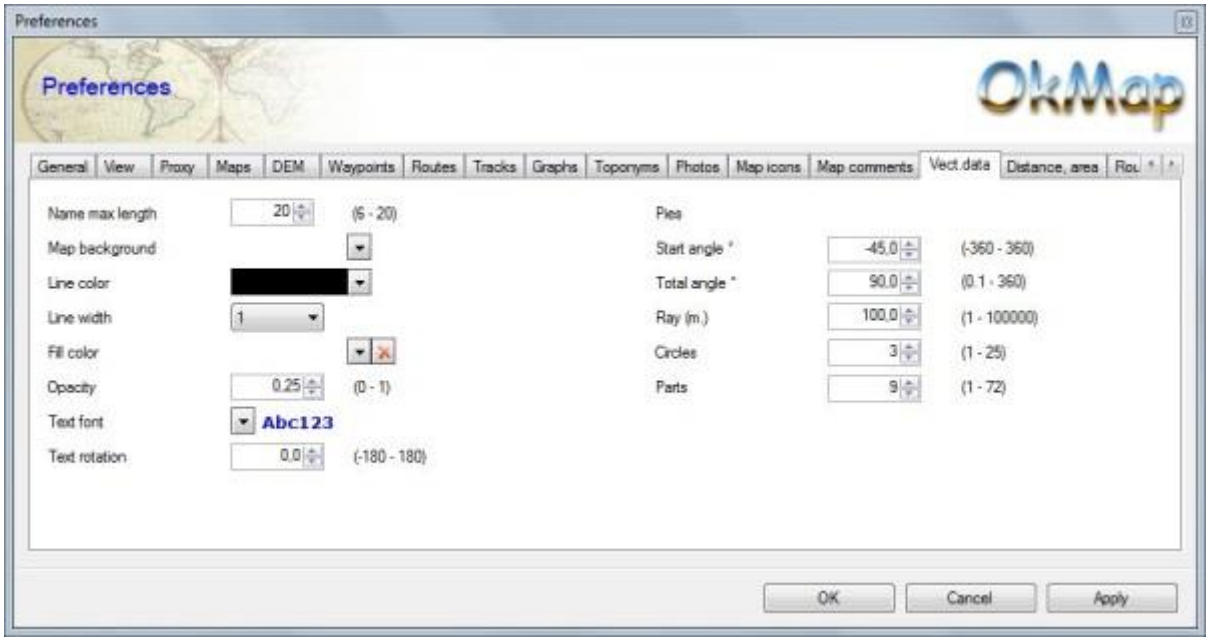
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Vectorial data

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying vectorial data page.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Vect. data*.

The following window is displayed.




In this window you can customize:

- Name max length: it's the maximum length in characters used for names of the vectorial themes.
- Map background: it's the background color to be used in the representation of vectorial maps.
- Line color: it's the color used in drawing the shapes lines (it can be customized for each vectorial theme).
- Line width: it's the line thickness in pixel used in drawing the shapes (it can be customized for each vectorial theme).
- Fill color: it's the fill color used in drawing the shapes lines (it can be customized for each vectorial theme).

- Opacity: it's the opacity of the fill color used in drawing the shapes lines (it can be customized for each vectorial theme).
- Text: it's the font and the color used in drawing the labels of the shapes (it can be customized for each vectorial theme).
- Text rotation: it's the rotation to apply to the labels of the shapes (it can be customized for each vectorial theme).
- Pies: Are the value used to draw pies:
  - Start angle: It's the orientation angle of the pie (0 = top, 90 = right, …).
  - Total angle: It's the angle of the sector (max 360° = circle).
  - Ray (m.): It's the ray in meters of the pie.
  - Circles: It's the number of circles inside the pie.
  - Parts: It's the number of sectors inside the pie.

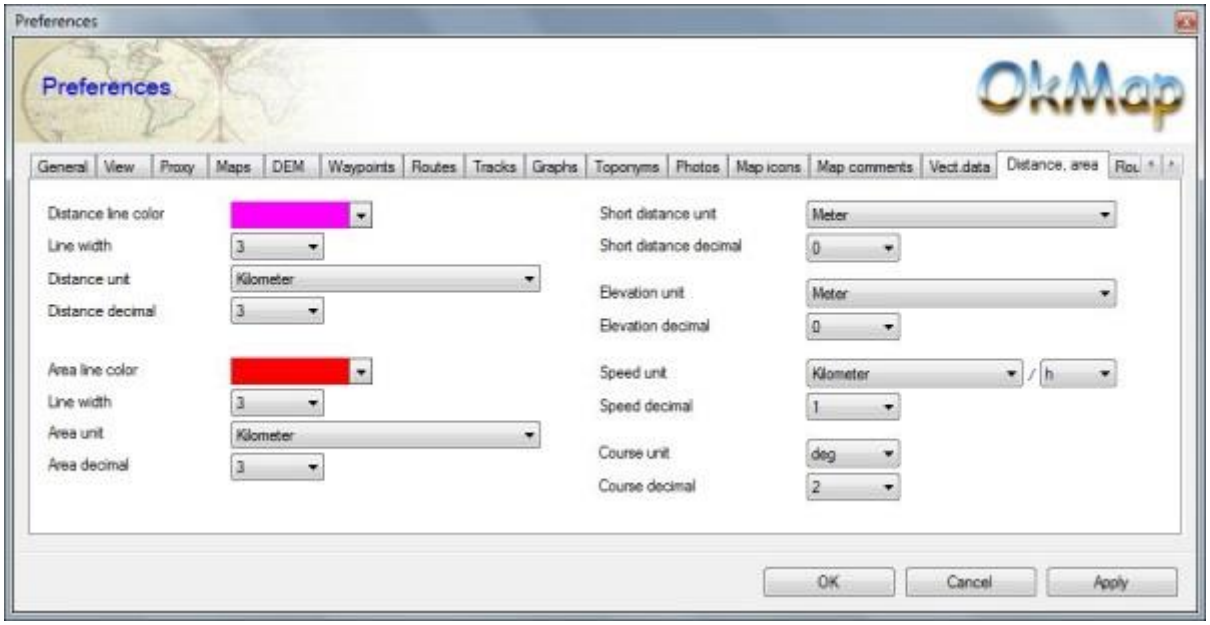
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Distance, area

It's used to customize the OkMap favorite settings, in particular, this refers to the calculation of the distances and the areas.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Distance, area*.

The following window is displayed.




In this window you can customize:

- Distance
  - Distance line color: it's the color used in drawing the distance lines.
  - Line width: it's the line thickness in pixel used in drawing the distances.
  - Distance unit: it's the unit of measure with which the calculated distance is represented in the status bar.
  - Distance decimal: it's number of decimal places (precision) with which the distance value is displayed.

- Area
  - Area line color: it's the color used in drawing the area polygons.
  - Line width: it's the line thickness in pixel used in drawing the areas.

- Area unit: it's the unit of measure with which the calculated area I represented in the status bar.
- Area decimal: it's number of decimal places (precision) with which the area value is displayed.

- Short distances
  - Short distance unit: it's the unit of measure with which the short distances are represented.
  - Short distance decimal: it's number of decimal places (precision) with which the short distance values are displayed.

- Altitude
  - Elevation unit: it's the unit of measure with which the altitude is represented.
  - Elevation decimal: it's number of decimal places (precision) with which the altitude value is displayed.

- Speed
  - Speed unit: it's the unit of measure with which the speed is represented.
  - Speed decimal: it's number of decimal places (precision) with which the speed value is displayed.

- Course
  - Course unit: it's the unit of measure with which the course is represented.
  - Course decimal: it's number of decimal places (precision) with which the course value is displayed.

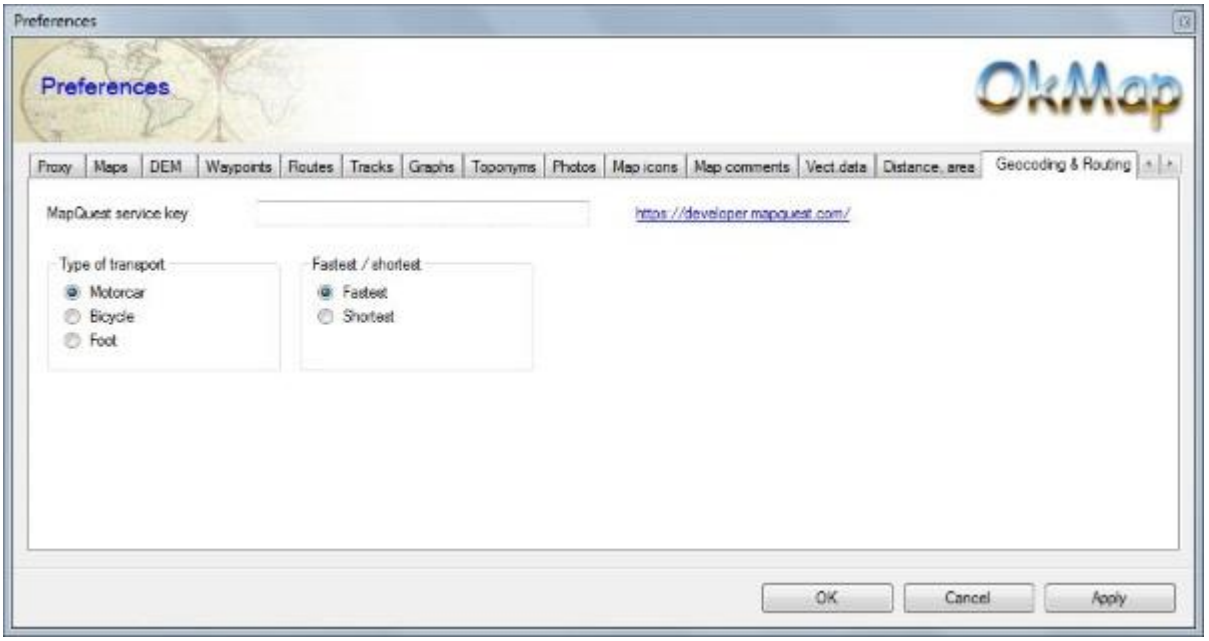
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences – Geocoding & Routing

It's used to customize the OkMap favorite settings, in particular, this refers to the geocoding service key and calculation of the road paths.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Routing*.

The following window is displayed.



In this window you can customize:

- MapQuest service key
- Transport type (motorcar, bicycle, walking)
- Fastest or shortest route

For more information on how to generate the MapQuest service key visit http://developer.mapquest.com.

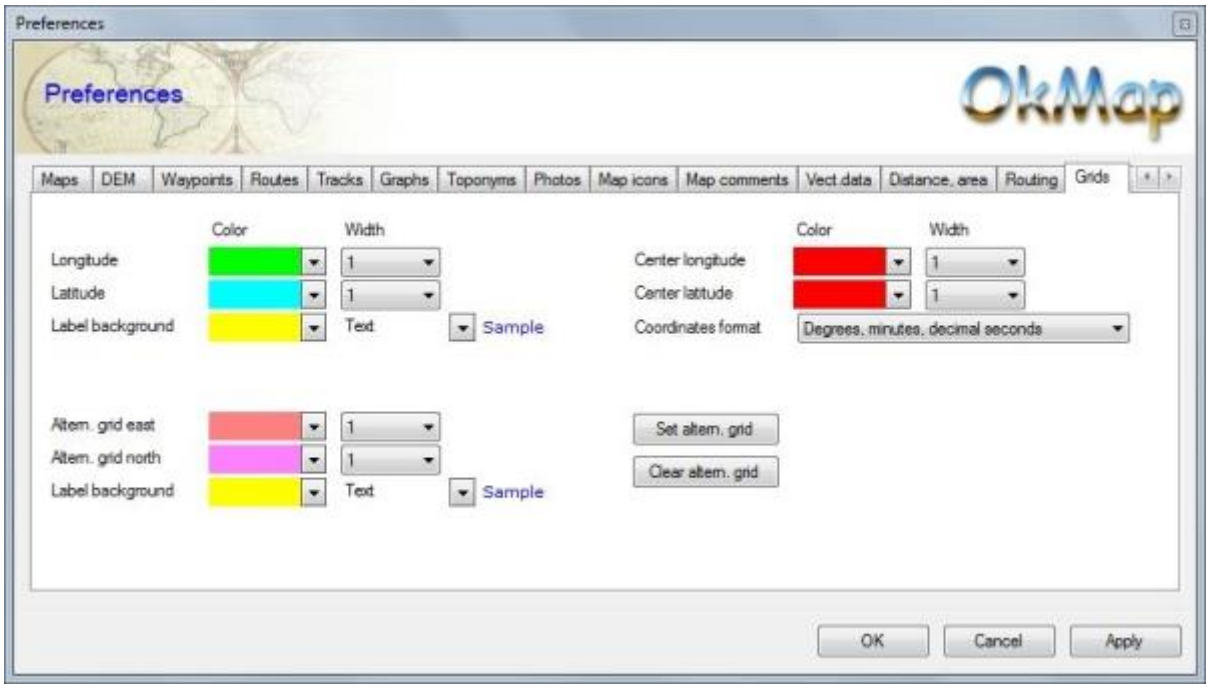
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Grids

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying of the grids.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Grids*.

The following window is displayed.




In this window it is possible to customize the colors and the line thicknesses used in the visualization of the grids:

- Longitude: the meridians in the visualization of the grids.
- Latitude: the parallels in the visualization of the grids.
- Center longitude: the meridian referenced to the center of the projection.
- Center latitude: the parallel referenced to the center of the projection.
- Label background: the background color of the labels of the grid coordinates.
- Text: the font and color of the labels text of the grid coordinates.
- Coordinates format: the grid coordinates format.
- Altern. grid East: the east-west lines in the alternative grid.
- Altern. grid North: the north-south lines in the alternative grid.
- Label background: the background color of the labels of the alternative grid coordinates.
- Text: the font and color of the labels text of the alternative grid coordinates.

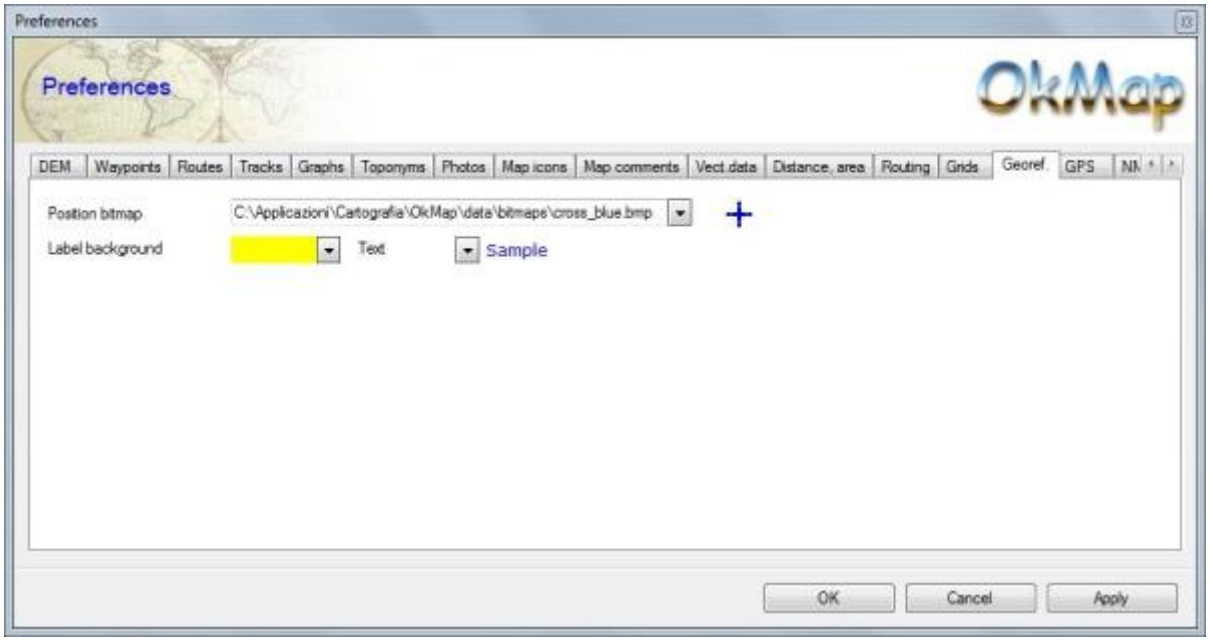
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Georeference

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying of the icons of the points in the georeferencing procedure.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Georef.*.

The following window is displayed.




In this window you can customize:

- Position bitmap: it's the name of the file bitmap to be used in drawing the points of georeferencing, displayed during the calibration of a new map raster.
- Label background: the background color of the labels of the points.
- Text: the font and color of the labels text of the points.

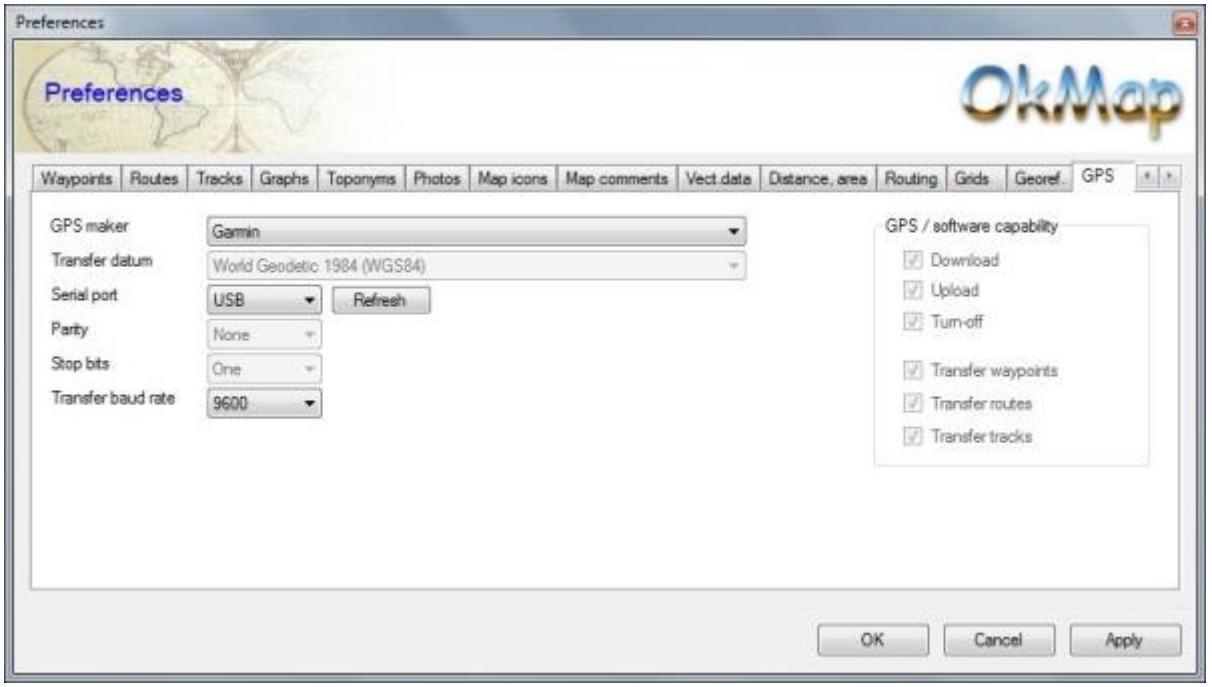
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - GPS

It's used to customize the OkMap favorite settings, in particular, this refers to the connection settings with GPS for navigation.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *GPS*.

The following window is displayed.




In this window you can customize the settings used in receiving and sending GPX data from/to GPS:

- GPS maker: it's the manufacturer of the used GPS.
- Transfer datum: it's the reference datum of the received / transmitted GPX object used by GPS device (not editable preset to WGS84).
- Serial port: it's the COM port number (among those available) through which the transfer happens; may also be indicated the USB port.
- Parity: bit parity check; may be: None, Even, Odd and Mark (not editable and None by default).
- Bit stop: it may be: None, One and Two (not editable and One by default).
- Transfer baud rate: Transmission speed in bits per second.

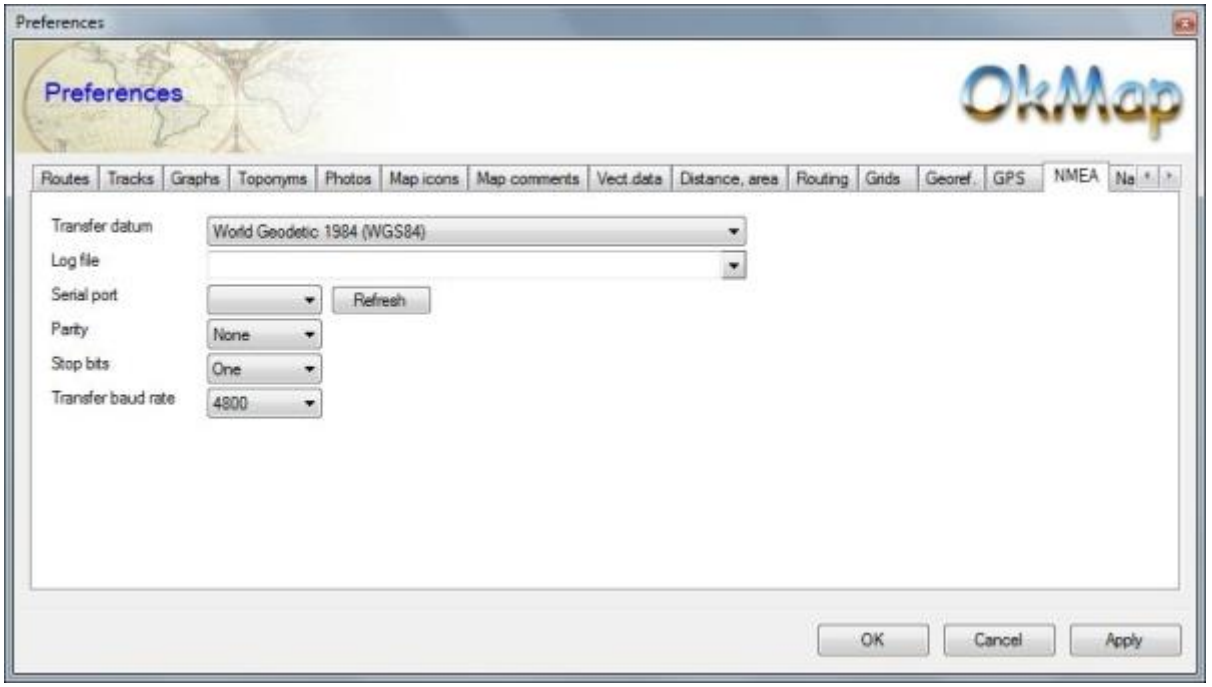
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - NMEA

It's used to customize the OkMap favorite settings, in particular, this refers to the navigation NMEA.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *NMEA*.

The following window is displayed.




In this window you can customize the settings used by the communication with the GPS during the NMEA navigation:

- Transfer datum: it's the reference datum on NMEA sentences received by GPS devices.
- File log: if specified, in this file are stored all records received from the GPS NMEA during the navigation.
- Serial port: it's the COM port number (among those available) through which the transfer happens.
- Parity: bit parity check; may be: None, Even, Odd and Mark.
- Bit stop: it may be: None, One and Two.
- Transfer baud rate: Transmission speed in bits per second.

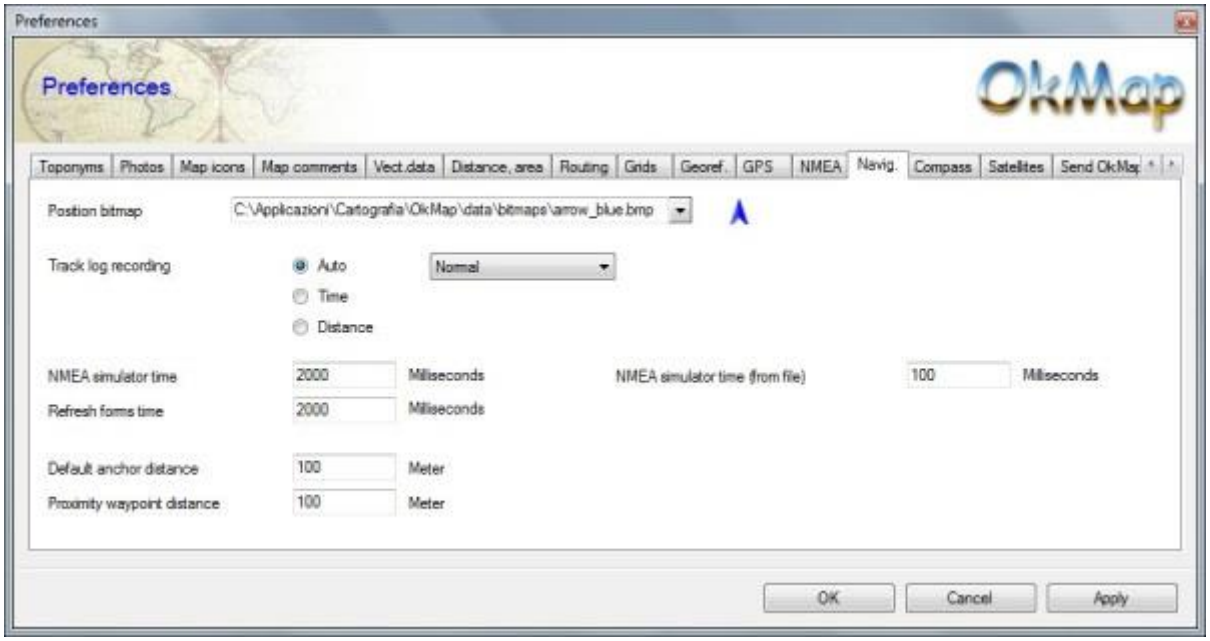
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Navigation

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying of our position during the navigation.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Navig*.

The following window is displayed.




In this window you can customize:

- Position bitmap: it's the name of the file bitmap to be used in drawing our current position on the map during the NMEA navigation; this bitmap undergoes a rotation angle indicating the followed direction.
- Recording type of the track log (auto, time or distance).
- Time interval (in milliseconds) between a simulated NMEA sentence and the next.
- Time interval (in milliseconds) between a simulated (from file) NMEA sentence and the next.
- Time interval (in milliseconds) between a refresh of the forms and the next.
- Default anchor distance.
- Proximity waypoint distance.

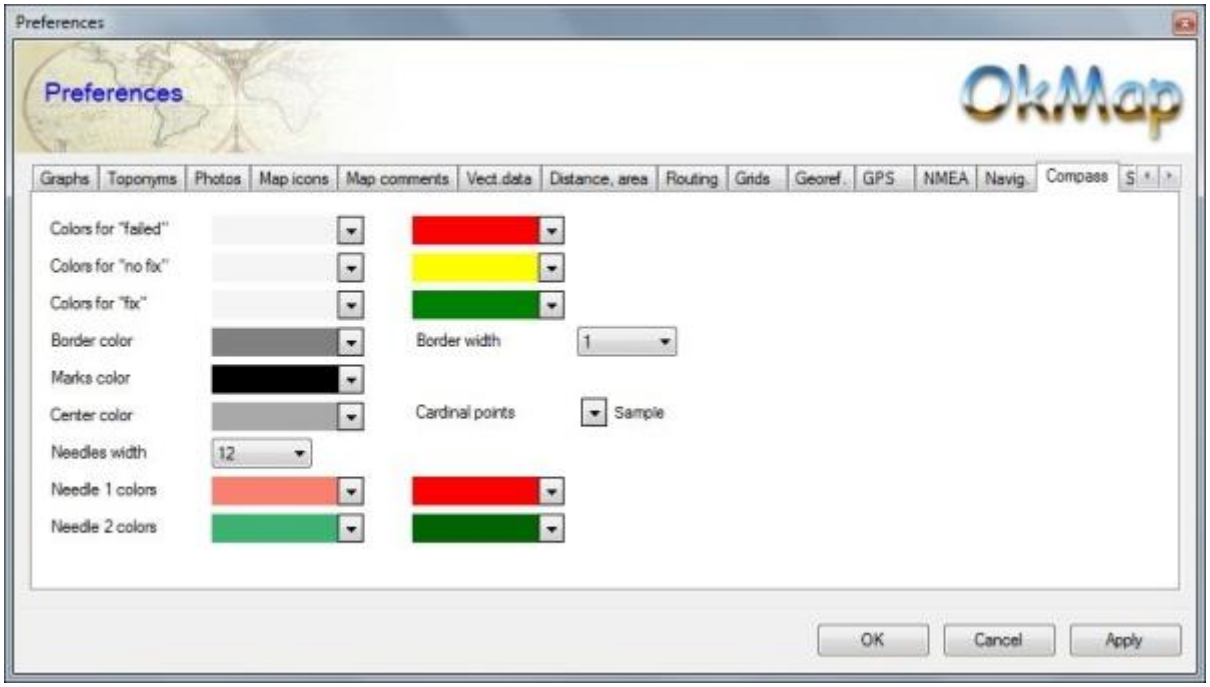
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Compass

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying of the compass.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Compass*.

The following window is displayed.




In this window you can customize:

- Colors for “failed”: the gradient colors used for compass background when status is “failed”.
- Colors for “no fix”: the gradient colors used for compass background when status is “no fix”.
- Colors for “fix”: the gradient colors used for compass background when status is ”fix”.
- Border color: it’s the color of the compass border.
- Border width: it’s the thickness of the compass border.
- Marks color: it’s the color of the marks around the compass.
- Center color: it’s the color of the central point of the needles.
- Cardinal points: it’s the font and color used to draw the cardinal points around the compass.
- Needles width: it’s the size of the needles of the compass.
- Needle 1 colors: these are the colors used to draw the needle n. 1 (bearing).
- Needle 2 colors: these are the colors used to draw the needle n. 2 (navigate to...).

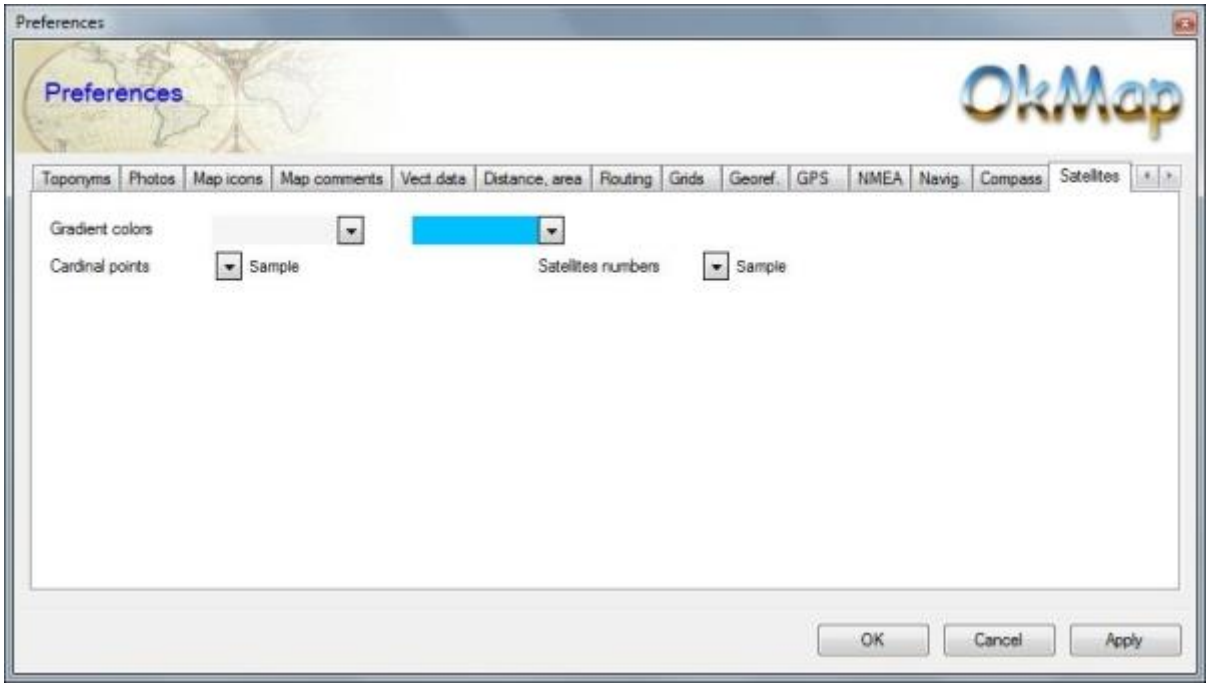
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Satellites

It's used to customize the OkMap favorite settings, in particular, this refers to the displaying of the satellites map.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Satellites*.

The following window is displayed.




In this window you can customize:

- Gradient colors: the gradient colors of the map background.
- Cardinal points: it's the font and color used to draw the cardinal points around the map.
- Satellites numbers: it's the font and color used to draw the numbers of the satellites.

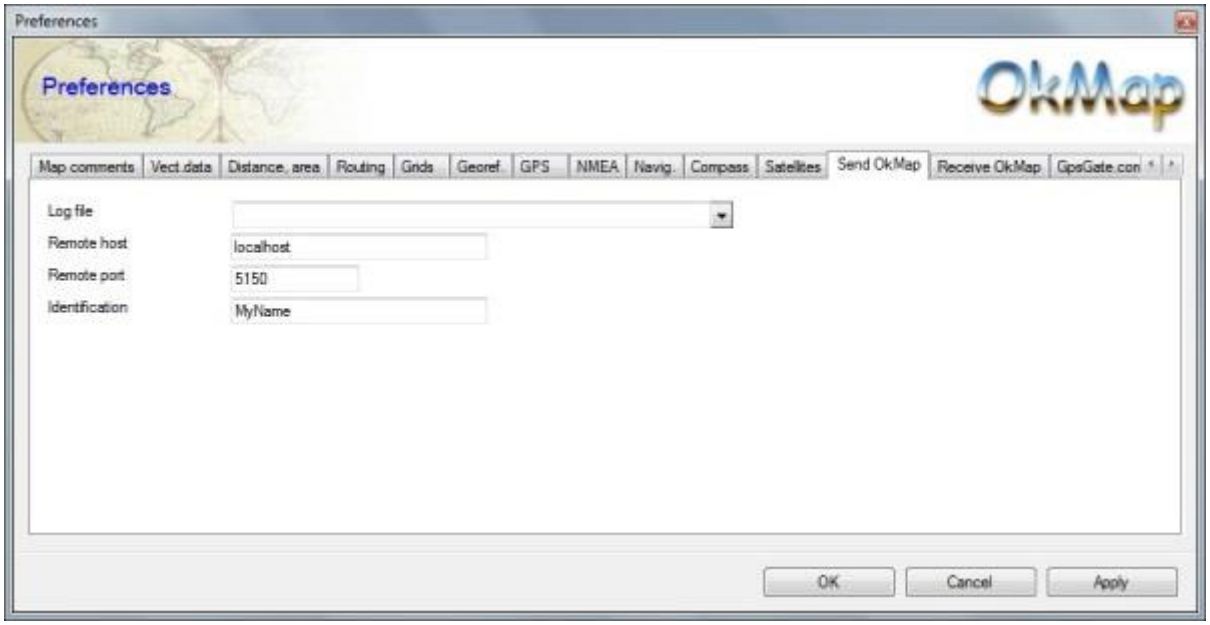
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Send OkMap

It's used to customize the OkMap favorite settings, in particular, this refers to the sending function of its position via socket.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Send OkMap*.

The following window is displayed.




In this window you can customize the settings used in communication with the remote server while sending your position during the NMEA navigation:

- File log: if specified, in this file are stored all records sent to the remote server.
- Remote Host: it's the IP address or the address name of the remote server.
- Remote port: it's the COM port through which the communication happens; this door must be open in a possible firewall.
- Identification: its' the string with which the client identifies itself to the remote server.

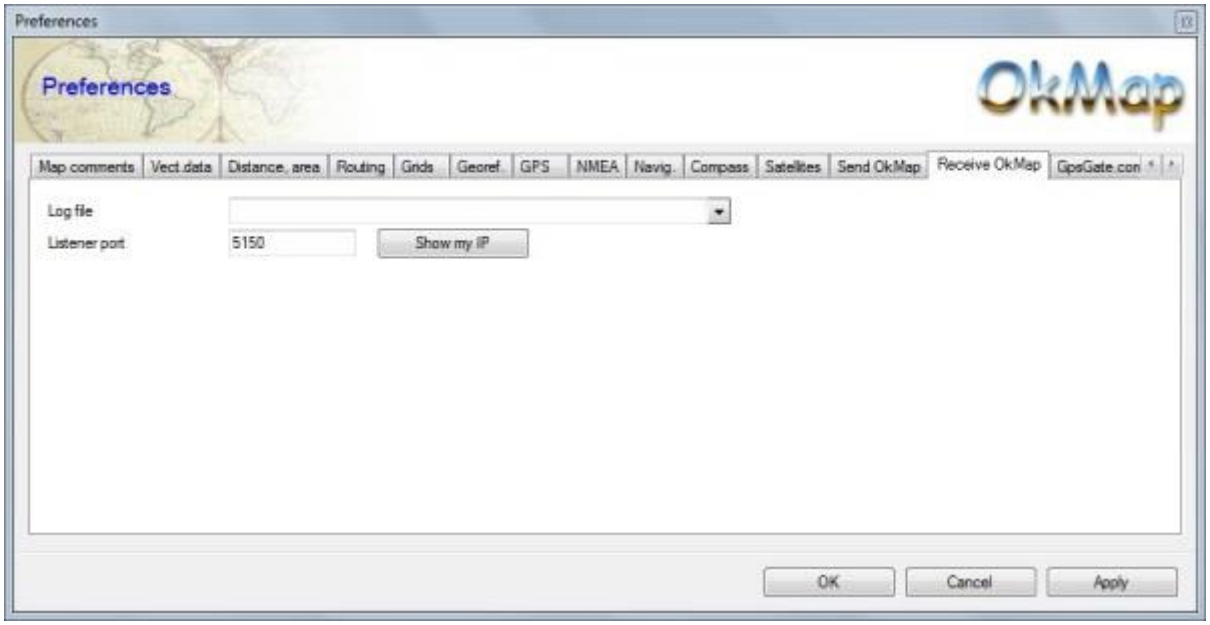
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Receive OkMap

It's used to customize the OkMap favorite settings, in particular, this refers to the settings for receiving data from remote clients via sockets.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Receive OkMap*.

The following window is displayed.




In this window you can customize the settings used for the activation of the receiving data from remote OkMap:

- File log: if specified, in this file are stored all records received by the server.
- Listener port: it's the COM port through which the communication happens; this port must be open in a possible firewall.

The "Show my IP" button shows the public IP address.

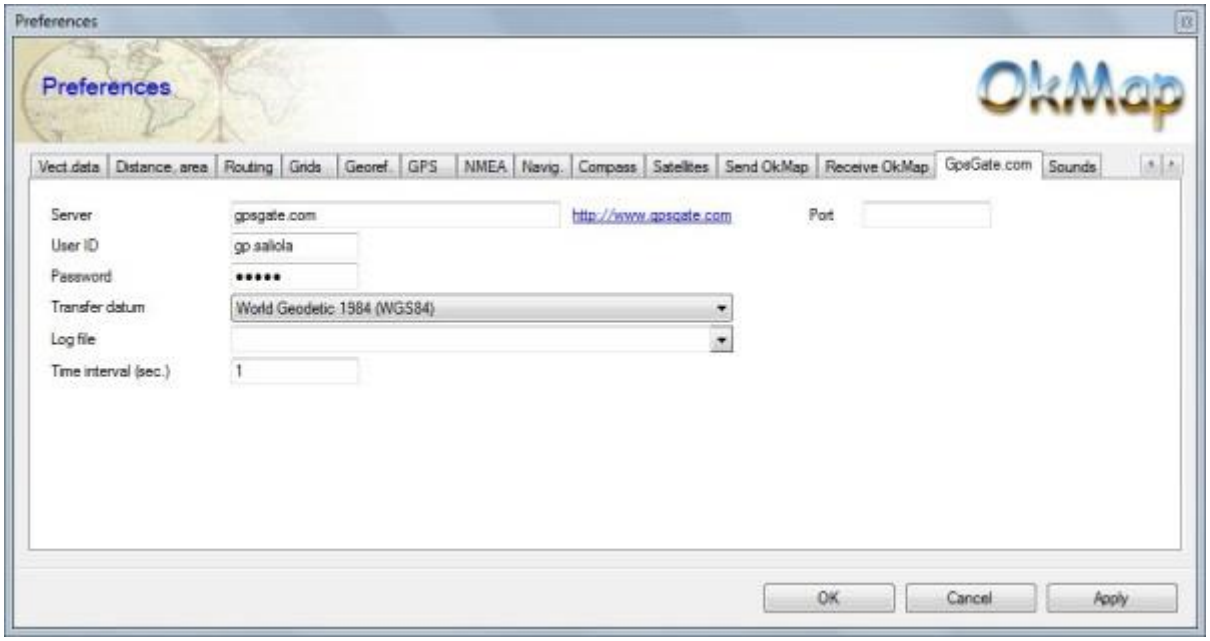
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - GpsGate.com

It's used to customize the OkMap favorite settings, in particular, this refers to the settings for the connection with the server GpsGate.com.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *GpsGate.com*.

The following window is displayed.




In this window you can customize the settings used for the activation of the functions send data to GpsGate.com and receive data from GpsGate.com:

- Server: It's the address of the remote GpsGate server.
- Port: It's the communication port of the remote GpsGate server.
- User ID: it's a string that identifies the user in connection to the server GpsGate.com.
- Password: it's the authentication password.
- Transfer datum: it's the reference datum of the geographical position sent by the clients and received by the server.
- File log: if specified, in this file are stored all records received by the server.
- Time interval (sec.): it's the time in seconds between data reception and the following one.

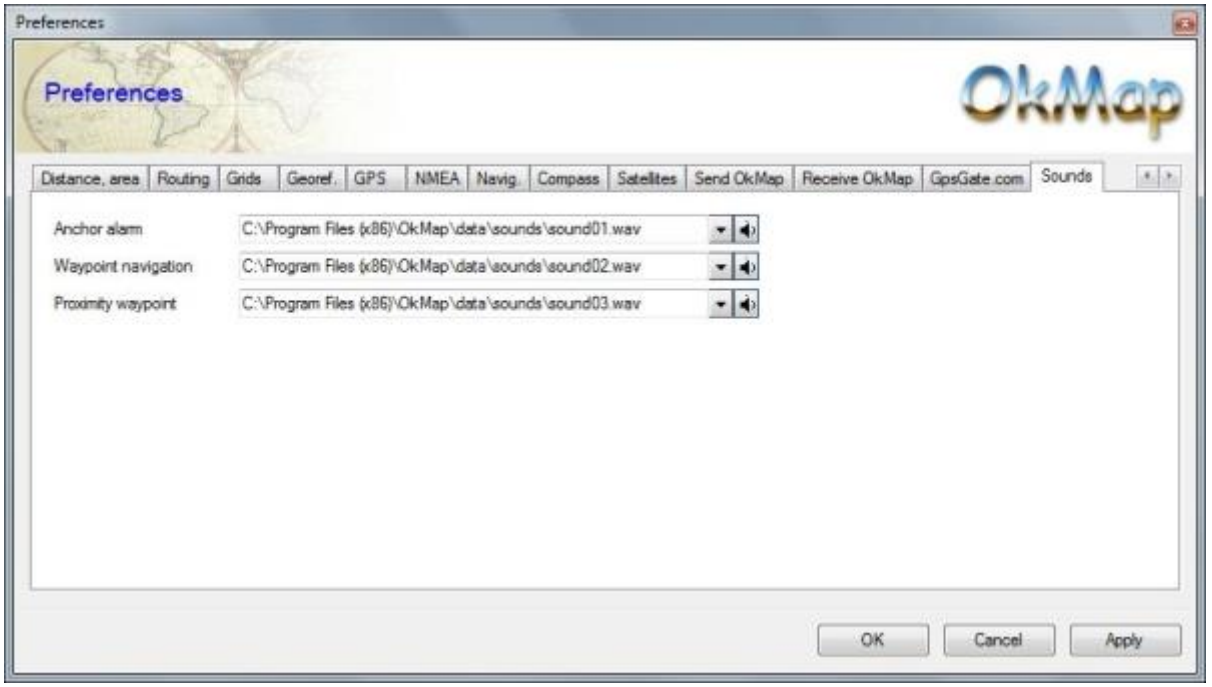
To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

## Preferences - Sounds

It's used to customize the OkMap favorite settings, in particular, this refers to the settings the sound files used in the navigation.

To activate this function use the menu *Utilities* - *Preferences* and open, clicking with the mouse, the section *Sounds*.

The following window is displayed.




In this window you can customize:

- Anchor alarm: sound file used in the anchor alarm function.
- Waypoint navigation: sound file used during the navigation toward a waypoint or during the navigation along a route.
- Proximity waypoint: sound file used during navigation with *Proximity waypoint alarm* enabled.

To save the modified data press the *Apply* button.
To save the changed data and exit function press the *Ok* button.
To exit without saving the data, press the *Cancel* button.

# Glossary

## A

**Accuracy**
Accuracy is the degree of precision in the positioning of lines and dots on paper. Many factors affect the accuracy with which the geographical features can be drawn on a map: the scale, the quality of the data source, the thickness of the lines adopted in the representation.

**Actuality**
is a measure of overall quality of a mapping which measures the percentage change between the time of detection and the current date.

**Address matching**
literally address detection, is an alternative system for data geocoding. With some software you can indeed build a system of reference that allows the identification of a point than through classical coordinate systems (e.g. Latitude and longitude) but by indications of addresses (street, house number, etc..) on, for instance, a road graph.

**ADSL**
ADSL stands means Asymmetric Digital Subscriber Line and is a technology that allows you to convert analog phone line (the traditional twisted pair copper) in a high speed digital line for an ultra-fast Internet access. ADSL is ideally suited to the way of browsing the Internet and to the use of multimedia content, both characterized by a greater flow of data from the network towards the user (downstream) and a smaller amount of data and control signals sent by the user to the network (upstream), which is why it is called 'asymmetric'.

**Aero photogrammetric restitution**
procedure which allows, using special instruments (analogue or digital photo renderer), to build a map (both on paper and digital) of a portion of land by stereoscopic aerial photographs.

**Algorithm**
algorithm well-defined complex instructions or operational requirements that govern the behavior of an operator (mechanical, electronic or human) to solve a problem. In a software corresponds to a set of instructions to the computer.

**Arc**
linear element stored in vector format consists of a begin pair of coordinates (starting node), a final pair of coordinates (end node) and a series of coordinate pairs such intermediate vertices. Each arc has a direction and a length. By combining several arcs together by the nodes it is possible to build some usable graphs, for example, for many types of analysis (road, hydrographic, etc.).

**Area compared**
see buffer.

**Attribute**
descriptive information associated with a geographic object and that characterizes it. Generally, in the GISs, indicates the features not graphics of the element or those that cannot be represented in the scale of acquisition. For example, they might be attributes of a linear element (arc) which represents a road: the type of pavement, the average number of vehicles in transit, width, etc..

## B

**Backup**
process by which you can save the entire patrimony of the data on media that ensure its preservation over time.

**Band**
frequency range of the electromagnetic spectrum in which, for example, the satellite sensors operate which are able to separate the information collected in the visible and infrared (temperature, humidity, etc.).

**Base mapping**
is the set of maps covering a certain territory, built with topographic and photogrammetric techniques, that represent the plans (watercourses, roads, railways, bridges, houses, etc.) and the altimetry consists of elevation points or curves of level.

**BIL (Band Interleaved by Line)**
is a standard format for raster data, in which information on the various bands are sequencing at the line level (the value of the pixels of the first line of the first band is followed by the match in the second band and so on, before continuing with the second line).

**BIP (Band Interleaved by Pixel)**
is a standard format of raster data, in which information on the various bands are sequencing at the pixel level (the value of the pixel of the first band is followed by the match in the second band and so on, before continue with the second pixel).

**Bit**
character that represents one of the 2-digit binary system: 0 or 1. It is the smallest unit of information and also indicates the smallest store unit. The name derives from a contraction of BInary diglT.

**Buffer, buffering**
buffering is an analysis process belonging to the scope: topological overlay. It lets you create polygons around elements (areas of respect). With it you can determine for example the not building area around roads with heavy traffic or areas around military or industrial zones, etc.. The size and therefore the radius of the respect area can be defined by the attributes of the items buffered for example on the streets (linear elements) the width or depth of trade for the antennas (elements point) the power of signal for industrial zones (elements ranges) the pollution load.

**Byte**
array of 8 bits: it is the smallest addressable unit in memory and it corresponds to the codification of an alphanumeric character.

## C

**CAD (Computer Aided Design)**
is a family of systems and software for computer-aided design, used for architectural design, civil relief, the mechanical and parametric design, the metric calculation, the design of wiring diagrams, etc..

**Check point**
a point of known coordinates recognizable on the image or the map that you want to georeference. Georeferencing algorithms usually require more control points (at least four) for each sheet.

**Class of elements**
a layer may contain several classes of information elements. Each geographic data can be represented by a class of elements such as an arc, a node, a polygon, an annotation, etc.. Each class of elements may have attributes associated with tables.

**Classification**
analytical procedure for the determination of classes that group homogeneous types of elements, such as the land use, the type of roads, the urbanization, etc..

**Coherence**
see logical congruence.

**Compression**
is a technique for compressing raster images to store them in less space. They used various compression algorithms, which generally must be followed by a decompression before the image can be used again.

**Conformal projections**
are projection systems generally used for mapping of oceans and atmosphere since they allow to maintain faithful to reality, the angular relationships between the elements and, therefore, the wind direction or against the weather.

**Connection**
is a topological properties of the elements of a GIS is represented by the sharing of an arc between two areas.

**Connection**
is a topological property of the elements of a GIS represented by sharing a node between two arcs.

**Curves of level**
is the set of constant quota lines that describes the plan land usually obtained by manually or automatically interpolation from a TIN, a DEM or DTM.

## D

**Data Bank**
see database.

**Database**
database (or archive) means a set of information of different kinds. These data are organized according to precise criteria which allow a rapids consultation.

**DBMS (Data Base Management System)**
system for storing and searching for information in a database.

**Decompression**
see compression.

**Default**
means the default choices made by the system (or program) in the absence of an explicit indication of the user.

**DEM (Digital Elevation Model)**
is a raster data model that represents the elevation of the land. Can be generated from a plain rated or curves of level and is generally used for conducting analysis of visibility, generate longitudinal profiles, perform analysis of slope and exposure, etc..

**Derived thematic maps**
they are maps obtained by interpolation of observed values or maps obtained from the analysis and correlation of additional derived thematic maps.

**Desktop**
feature of computers and programs that can be placed on a desk and used by the user without requiring additional supports.

**DIGEST**
is an international standard that defines a data format typically used for topological data interchange among GIS.

**Digital mapping**
is the digital version of a traditional map, the location and description of the elements are stored in a series of files on your computer. To locate the position of the geographical elements is used a system of Cartesian coordinates x, y or x, y, z: each point is represented with a single pair of coordinates x, y, and each line is stored as an ordered set of coordinates x, y; each area is stored as an ordered set of x, y coordinates that define the outer segments

of the closed figure. With coordinates x, y is possible to represent points, lines and polygons as lists of coordinates, rather than as a drawing. In most cases, the storage elements using geographic coordinates of the real world: these coordinates represent a real location on the surface of the earth, in one of the so many coordinate systems. The relationship between geographic elements are expressed on a digital map, with the use of topology. The characteristics of the geographical features are stored in a computer file, usually called table, as a set of numbers and characters.

**Digital**
digital data information expressible through integers that can be stored on a magnetic support.

**Digitizer**
hardware device used for the manual acquisition of graphical information (maps, documents, etc..) in vector format. It allows an operator to draw with a cursor all the graphic elements that compose the document or the map to be scanned.

**DIME (Dual Independent Map Encoding)**
is a standard format for vector data used by the U.S. Census Bureau and had replaced since 1990 by TIGER.

**Directory**
logic partition of a mass storage, in which a user can store a set of files usually about a specific topic.

**DTM (Digital Terrain Model)**
literally digital terrain model, raster or vector, see DEM and TIN.

**DXF (Drawing eXchange File format)**
format for not topological vector data typical of the CAD used by AutoCAD, but also by many GIS, to exchange data.

**Dynamic segmentation**
is an extension of the data model of a GIS that allows to overlap to the physical topological structure a new physical topology, defined in a logical manner, without the need to change the data in the database. For example, data relating to a road network such as the state of the pavement, the frequency of accidents, speed limits can all be associated to the single traits (route) of the same graph that represents the road network.

## E

**Eliosynchronous orbit**
the name comes from the fact that this orbital configuration the angle formed by joining the Sun - the center of the Earth and the orbital plane of the satellite is kept constant over time. This makes the passage of the satellite occurs at the same time for the same latitudes.

**Entity**
discontinuous objects belong to the category of entity, spatially delimited by precise boundaries and, possibly, characterized by specific attributes. Examples of entities are the allocation of territory in normative areas or the graph description of a network of transport infrastructure.

**Equidistant projections**
are projection systems that preserve the distances among determined points.

**Equivalent projections**
are projection systems that are generally used in cases where the user must compare the spatial dimensions (e.g. forests or areas for agriculture).

**ERDAS**
is the name of a software manufacturer for processing remotely sensed images used also to define a owned format for raster data.

**Esaustivity**
is a measure of overall quality of a cartography that measures the excess or the lack of information.

## F

**Field**
in a table of attributes, indicating a location within a record dedicated to a single characteristic of each element of the table. See table of attributes.

## G

**Gauss-Boaga**
is a system of coordinates in inverse cylindrical projection typically used for the cartography of the territory in Italy (IGMI, Inventory, Regional Technical Papers, etc..).

**GB (Gigabyte)**
unit of information in the memory, equal to one billion bytes (characters).

**Genealogy**
is a description of the overall quality of a mapping and it corresponds to all the information on the sources and on the treatments.

**Generalization**
algorithm present in many software GIS and CAD that allows you to prune the number of the vertices that compose one or more linear elements. The operations of generalization are necessary to prune a data and move it to a larger scale, removing the vertexes and making it the most linear element with the level of accuracy defined.

**Geographic map**
is a graphical representation of geographic elements or other spatial phenomena (lakes, rivers, roads, cities ...) which provides two types of information about the area represented: the position and the aspect. The location allows you to understand where a particular geographical feature is on the surface of the earth and what are its relationships with the other elements. The issue illustrates us both the qualitative characteristics (name, type ...) and those quantitative (area, length ...) of the represented element. Each map shows, in addition to descriptive and spatial information, some technical features that define and determine its use. These features include the scale, the accuracy, the projection system, the system of coordinates.

**Geographic projection**
is a system of global projection, historically used for first, based on the earth's subdivision in meridians and parallels. Its system of reference, latitude / longitude, measure the angular distances, respectively, starting from the reference plane of the equator and from the meridian of Greenwich.

**Geographical Data Base**
database dedicated to information of such territorial.

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**Geomarketing**
GIS application that displays the contents of a database, coupled by a geocode (municipality code, address, sales area, zip code, etc..) to a map, to view marketing phenomena affecting the territory and develop spatial analysis (distribution, counters, basins of use, compared with demographic, etc..).

**Geometric congruence**
is a parameter of local quality of a cartography defined as the absence of errors of form and position that cannot be detected without direct verification in the field.

**Georeference**
software procedure that consists of positioning, by points at known coordinates (control points), vector data or raster image in its respective area of real territory, according to a fixed reference system.

**Geostationary satellite**
an orbiting satellite above the equator at a height of about 36,000 km., whose period of revolution around the Earth coincides with a time of Earth's rotation. For this reason the satellite constantly see the same portion of the Earth (such as METEOSAT). Is also called geosynchronous satellite.

**Geosynchronous satellite**
see geostationary satellite

**GIS (Geographical Information System)**
a complex set of hardware, software, and human to acquire, to process, to analyze, to store and to return, in a graphical and alphanumeric format, data related to a territory.

**Global quality**
set of parameters that characterizes the quality of a geographical database as a whole (exhaustiveness, current affairs, genealogy).

**GPS (Global Positioning System)**
is a system that allows, through a receiver, a dedicated software and a constellation of satellites to determine the position on the ground and the altitude of a point, with an accuracy that varies from a few millimeters to a few meters depending on the type of equipment and operating procedures of relief used.

**Graph**
is a related set of arcs that, in a GIS, generally describes a network (road, hydrographic, technology, etc..). The GIS software have generally functions of analysis and modeling of networks based on a graph (optimal path, optimization of stops, location analysis, etc..).

**GRASS (Geographical Resource Analysis Support System)**
is the name of a software for image processing used to define the corresponding raster data format.

**GRID**
is the name of the extension of ESRI ARC/INFO processing databases in raster format and is also used to define the corresponding data format.

**GUI (Graphical User Interface)**
software for creating and managing graphical user interfaces. Allows the user to access the system functions through the mouse also and through simple graphical objects (buttons, scroll lists, icons, images, etc..).

## I

**IGES (Initial Graphics Exchange Standard)**
ASCII vector data format not topological and uncompressed, typical of the CAD, made by the U.S. Department of Commerce and used, sometimes by GISs, to exchange data.

**Image processing**
set of activities concerning the development of images in raster format. Many of the techniques used in this discipline requires complex mathematical procedures with the objective to determine the phenomena described by the image such as, for instance in GIS, pollution, humidity and temperature to the ground, vegetation, etc..

**Informatics system**
Set of computer system hardware and software that characterize an information system.

**Informative system**
Set of information, system equipment, procedures and people who have the task of collecting, organizing, selecting, storing and communicating data concerning the activities of an organization. Its aim is to provide operational decision makers all the information necessary to make the best choices possible.

**Interpolation**
technique through which it is possible to build a linear path, of which it is known only a discrete number of points. Constructing a grid of points you can get an estimate of the position of points that you do not possess.

**ISDN**
stands for 'Integrated Services Digital Networks', and is a term created by the organization ITU-T. It is, in practice, a total conversion to digital of the actual telephone net, using the existing wiring and switching equipment.

**Isogonic**
property of some projection systems to maintain unchanged the measures of the angles among straight lines.

## K

**KB (Kilobyte)**
unit of information in memory, equal to one thousand bytes (characters).

## L

**Lambert**
is a conic projection that can be conforming or equivalent, particularly used in the U.S. by the Geological Survey, in Italy and in France.

**LANDSAT**
family of satellites designed for observing the earth through multispectral sensors.

**Latitude**
see geographical projection.

**Layer, Informative layer or Geographical layer**
is the basic unit of data management and defines the positional and thematic attributes for elements of map of a given area. The informative layer or geographical layer are the set of homogeneous elements that compose a map, such as roads, rivers, forests, etc..

**Layer**
see informative layer.

**Legend**
is a tool on the papers that associates the graphic symbols used to the single thematic, for readability.

**Library**
set of software modules common to several programs.

**Local quality**
set of quality parameters for each individual mapping element (metric precision, resolution, semantic precision, consistency or logical consistency, geometric congruence).

**Logical congruence**
is a parameter of local quality of a mapping defined as the absence of inconsistency detected independently of a case in reality (a building on a street, two curves of level that intersect, an attribute with a value outside the indicated range, etc..).

**Logical expression**
consists of logical operators, operands and pairs of brackets, organized according to syntactic rules specified, so as to express a group of operations that provide a single result. It is used to make selections between classes of elements in the process of data analysis.

**Logical operator**
entities used to formulate, for instance in a database, the logical conditions for the selection of records in according with the values of the fields. See SQL.

**Longitude**
see geographical projection.

## M

**Mass memory**
device that allows the permanent storage of data (generally the hard drive of the computer).

**MB (Megabyte)**
unit of information in memory, equal to one million bytes (characters).

**Metadata**
are information about the data sets in a database. A set of metadata can be considered consistent when, in the way most synthetic possible, provides an adequate description of the content, quality and characteristics of the data.

**Metric precision**
is a quality parameter of a local mapping defined as the difference in position of a point on the map compared to its real position in the national cartographic reference system.

**Mosaicing**
is the set of operations that, within the GIS, allows you to merge multiple maps in digital format to create a territorial continuity.

## N

**Nadir**
the vertical drawn from any point within the earth's surface, where is the observer, meets the celestial sphere in two opposite points. Nadir is what lies below the horizon, the other, which is above, is the zenith.

**Native format**
source format in which an object (program, file, data) was originally written.

**Node**
is a point with topological characteristics describing the beginning or end of an arc.

**Nominal scale**
is a parameter that defines the scale of reference for a digital mapping according to the corresponding scale of a traditional cartography realized following the same requirements of metric accuracy.

**NTF (National Transfer Format)**
data format used for interchange of data between topological GIS (adopted by the Italian Inventory).

## O

**Object**
physical or logical entity defined by a set of characteristics and rules of behavior which express the state of static or dynamic. For example in a GIS object could be the set of a telephone plant, its connections and its related management procedures.

**Open source**
mode of software distribution such that the programming code is issued along with the program.

**Orthogonalization**
see recording.

**Orthophotography**
technology for the production of orthophotos employing tools and procedures can provide a metric representation of the land in the form of photographic images.

**Overlay, topological overlay**
procedure of spatial analysis that allows to overlap and to intersect the layers uniting the information associated with each of them to produce a new layer of synthesis.

## P

**Pan**
positioning function of the graphic images on the screen depending on the choice of a new central point or on the scroll of the graphic window.

**Password**
keyword, which is the access code for a given user name.

**Path**
ordered set of nodes and arcs that connect origin and destination.

**Photogrammetric**
see aero photogrammetric restitution.

**Photo interpretation**
technique that allows experts to determine and classify spatial phenomena by reading aerial photographs or remotely sensed images such as, for example, vegetation types, determination of faults or updating of existing cartographic maps.

**Photo plain**
mosaic of aerial photos straighten particularly applicable to flat land.

**Pixel**
contraction of picture element, is the basic component of a raster image characterized by an associated value.

**Plotter**
equipment that is used to draw graphs or drawings prepared by a computer. Can be a pen, electrostatic, inkjet or thermal transfer.

**Plug-in**
is the addition of some option / application to another application. Between sheets of Excel, for example, consists of inserting 'specific options' to see particular sheets.

**Point**
geometric element used to define the position of items that are points in the scale of acquisition, defined by a pair of coordinates (x, y) and eventually by a quota (z).

**Polygon**
closed area delimited by arcs.

**Primary key**
one or more fields whose values uniquely identify a row in a table of the database.

**Process**
the term process is intended to indicate an ordered sequence of operations whose final purpose is to obtain new data or revise existing ones in a form which facilitates the interpretation and evaluation. Fundamental elements for the definition of a process are the

data, the operators and the links between the operators to determine their order of execution.

**Projection systems**
are systems that can represent the surface almost spherical Earth on a plane, keeping some conformity (isogons, equivalence, equidistance, etc..): the best known are the Geographical one, the UTM, the Gauss-Boaga and the Lambert others are the Conic, the Polar, the Stereographic, the Cylindrical and the Planar also variously combined.

**Projection**
see geographic projection.

## Q

**Query**
set of SQL statements that allow you to extract information from the geographical and alphanumeric database

## R

**Raster image**
any image can be thought of as consisting of a set of small equal areas (pixels), arranged along lines and columns, such as to constitute a matrix. The values associated with each cell may express both graphical information (color, shade of gray, etc.) and descriptive (temperature, slope, etc..).

**Rasterization**
operation that allows to automatically obtain a raster image from vector image or paper documents (scanner).

**Record**
group of contiguous positions of information (fields), including uneven, which can be accessed according to different modes. See table of attributes.

**Recording**
are the necessary techniques to georeference and rectify raster images. In fact, aerial photos and satellite images, as well as having to be positioned correctly (collimating the coordinates of known points on the ground with those of image objects) are also to be re-calculated using the angle from which it was taken.

**Reference system**
each projection has its own reference system from which it starts to calculate the distances. For example, the geography projection uses as a reference the intersection of the Greenwich meridian and the Equator, the UTM provides six degrees of predetermined segments called fused these divided into zones (for Italy 32, 33 and 34), the Gauss-Boaga, starts from Monte Mario (Rome) and uses coordinates conventionally measured in kilometers from 1500 to 2520 left and right of the meridian of reference.

**Regression**
is an interpolation between different statistical surveys, such that a correlation is identified between the data, often due to geometric curves.

**Relational database**
method of structuring data in the form of a collection of tables that are logically related to each other through shared fields. Each element can be found in relation to the table name, the name of the field, and the value of the primary key.

**Relationship**
in a relational database the relationship is the logical link among two tables of data through the primary and secondary keys.

**Resolution**
is a measure of quality local of a mapping and it corresponds to the size of the smallest detail represented in the mapping vector and to the length of the side of the cell (pixel) in raster format.

**RLC (Run Length Coded)**
is a standard of raster data compression. See compression.

**Route**
element at the base of the dynamic segmentation to which can be associated attributes. The route can be constituted by a portion or subset of arcs without its beginning or end node must coincide with the start or end of an arc.

**Routine**
compilation of a sequence of actions necessary to perform an operation, which are invoked by the program whenever it is necessary to perform such operation.

## S

**Scale**
indicates, in practice, how many times a portion of the land surface has been reduced in order to be represented on a sheet of paper. It is expressed, in general, as the ratio between a distance on the paper and the corresponding distance on the ground. The ratio of scale used for a map determines the information content and the size of which can reasonably be represented. We define large-scale maps (1:500, 1:1000, 1:2000), medium scale (1:5000, 1: 10000) and small-scale (1:25000 onwards).

**Scanner**
hardware device for the automatic acquisition in digital format of graphic elements (maps, photos, pictures, etc..). Graphical information is stored in raster format. It is possible nevertheless through special tools software to convert such information in vector format (vectorization).

**Secondary key**
one or more fields whose values uniquely identify a row in another table of the database through a relationship with the primary key.

**Semantic precision**
is a quality parameter of a local mapping defined as the correspondence between reality and the qualitative attribute associated with the object.

**Sensor**
detector used in remote sensing that converts electromagnetic radiation into electrical signals interpretable. Active sensors measure the energy reflected by the objects, but emitted from a device on board. Active radar sensors, in particular, are characterized by the fact that they can operate even in the presence of weather disturbances, such as SAR (Synthetic Aperture Radar) on the satellite ERS-1. Passive sensors measure the energy emitted by the sun and reflected by the earth or energy spontaneously emitted from objects, such as the TM (Thematic Mapper) and MSS (Multi Spectral Scanning) on Landsat 5.

**Shortest path**
is an algorithm of analysis that can determine within a graph, the path that optimizes a parameter in the networks, the impedance or that determines the difficulty of crossing the auction of the graph, such as a road network the route that minimizes the distance or time within the limits of speed, track, maximum weight allowed, etc..

**Simple thematic maps**
maps entered into the system and here used without modification or GIS maps created internally but still represent 'primitive' maps, not derived from processing of other elements of the database.

**SIT (Territorial Informative System)**
Italian acronym corresponding to the Anglo-Saxon GIS.

**Spatial data**
data characterized by a geographical reference.

**Spatial relationships**
see topology, contiguity and connection.

**SPOT (Système Probatoire d'Observation de la Terre)**
satellite family for multispectral remote sensing system with mobile aim system. The definition on the ground is 20 meters for the multispectral and 10 meters for the panchromatic. The first launch of this French system dates back to 1986.

**SQL (Structured Query Language)**
structured language for the consultation and the selection of information in a relational database.

**Symbols**
are the graphical primitives used to represent on paper or video phenomena occurring in the territory. The symbols can be landing-nets to prime an area, linear (continuous, dashed, drawn - point, etc..), to trace linear features or point (cross, star, triangle, etc..), to indicate a specific location. Each symbol can be designed in a wide variety of colors.

## T

**Table of attributes**
tables are an integral part of the layer information. Each table is for a homogeneous group of geographic map (roads, rivers, contours, etc..) and consists of a variable number of rows and columns. Each row (record) contains a description of a single geographical feature and each column (field or attribute) stores a specific type of information. The characteristics of the geographical elements are generally translated into numeric or alphabetic, before being inserted in the relevant table.

**Template**
in GISs, template are graphic elements (usually linear) that belong to different layers of information. The presence of templates greatly complicates the management of geographic database, for example by imposing rules for updating the data. If you update some elements of a layer information should be updated in all layers that contain words related to the same elements. A typical example is the limit for buildings in the layer on the building, which coincides with the start of the pavement layer on the streets.

**Territorial continuity**
means a continuous geographical coverage, in alternative to the classical subdivision by map sheets.

**Thematism**
representation of a raster or vector maps in which points, lines or surfaces are associated with symbols, textures, or colors that represent the result of analysis of quality (land use, zoning areas, intensity of traffic on a road, etc..).

**Theodolite**
topographical tool used for geodetic measures.

**TIFF (Tag Image File Format)**
is a standard format for the interchange of raster data.

**TIGER (Topologically Integrated Geographic Encoding and Referencing)**
is a standard format for vector data used by the U.S. Census Bureau since 1990 in place of DIME.

**TIN (Triangulated Irregular Network)**
literally irregular network of triangles, is a three-dimensional model of the terrain generated from a sparse set of points listed (rated plan) consists of a network of triangles as equiangular, equilateral, and therefore, not possible since which can interpolate contours,

conduct analysis of visibility, generate longitudinal profiles, perform analysis of slope and exposure, etc..

**Topology**
is a set of rules to define explicitly the relationships, the relationships of connection and contiguity between spatial elements and to link these elements with their descriptions (attributes). In a topological data model, for example, you can recognize and identify the areas adjoining the lines that demarcate each area (boundaries).

**UMTS**
is the acronym of Universal Mobile Telephone System and stands for the third generation of mobile telephone services. The analogical network was the first generation of mobile telephony, the GSM network, which is still active, is the second. The new UMTS technology seeks to improve and expand existing capacity of mobile technologies, radio and satellite, providing more capacity and a range of superior services. Through the new UMTS technology will be available a series of individual multimedia services, such as the association of the number of the person, and not to a number of customers or an office.

## U

**User-name**
name by which the user is preventively identified to access a computer network, database or protected file.

**User interface**
is the set of tools, the purpose of which is the communication between the user and the procedures of the hardware and software system used.

**UTM (Universal Transverse Mercator)**
is a cylindrical projection inverse adopted worldwide.

## V

**Vectorial**
is a system for storing graphics data according to which the objects are stored according to the Cartesian coordinates of the points and lines that compose them.

**Vectorialization**
procedure that allows an automatic or semiautomatic way (e.g., with the assistance of an operator) to draw a set of vectors from a raster image.

## W

**Wizard**
installation programs or assisted creation of documents or applications, which guide the user step by step towards a final objective.

## Z

**Zenith**
see nadir.

**Zoom**
enlarging or reducing video function (in, out) present in the most of graphic software.